Additional funding for the President's Malaria Initiative has been allocated under a Continuing Resolution from Congress for the remainder of FY07. USAID Malaria Programs were allotted $248 million ($25 million above the President's 2007 request) to allow the Agency to expand its bilateral global malaria initiative activities from the current 3 countries to 7. Country programs will expand access to long-lasting insecticide treated bednets and indoor residual spraying, promote and support effective malaria treatment through the use of proven combination therapies; and increase prevention efforts targeted to pregnant women. With the additional funding FY 2007 Malaria Operational Plans (MOPs) will be updated. Revised MOPs will be posted soon.

PRESIDENT'S MALARIA INITIATIVE

Malaria Operational Plan (MOP)

RWANDA

FY 2007

January 5, 2007

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List of Abbreviations

ACT	artemisinin-based combination therapy
AL	artemether-lumefantrine
ANC	antenatal care
AQ/SP	amodiaquine-sulfadoxine-pyrimethamine
ARV/ART	anti-retroviral therapy
BCC	behavior change communications
BTC	Belgian Technical Cooperation
BUFMAR	Office for the Not-for-Profit Medical Facilities in Rwanda
CAMERWA	Central Drug Purchasing Agency for Rwanda
CBD	Community-based Distributor
CCM	Country Coordinating Mechanism
CHW	Community Health Worker
CNLS	National AIDS Commission
CSHGP	Child Survival and Health Grants Program
DDT	dichloro-diphenyl-trichloroethane
DHS	Demographic and Health Survey
EANMAT	East African Network for Monitoring Anti-malarial Treatment
EPI	Expanded Program for Immunization
FBO	faith-based organization
FOSA	Formation Sanitaire (public and FBO health facilities)
GFATM	Global Fund to Fight AIDS, TB, and Malaria
GOR	Government of Rwanda
HBMF	home-based management/of fever
HMIS	Health Management Information Service
HIPC	Highly-Indebted Poor Countries
IDA	International Development Association
IEC	Information, Education, and Communication
IMCI	Integrated Management of Childhood Illnesses
IPTp	intermittent preventive treatment for pregnant women
IRS	indoor residual spraying
ITN	insecticide-treated bed net
KfW	KfW German Development Bank
LSHTM	London School of Hygiene and Tropical Medicine
LLIN	long-lasting insecticide-treated bed net
LBW	low birth weight
MAC	Malaria Action Coalition
MCH	maternal and child health
MEWS	Malaria Early Warning System
MINISANTE	Ministry of Health
MINAGRI	Ministry of Agriculture
MNECOFIN	Ministry of Finance
MIP	malaria in pregnancy
MOH	Ministry of Health
MRC	Medical Research Council (South Africa)

NGO	non-governmental organization
NMS	National Meteorological Service
PBF	Performance-based financing
PEPFAR	President's Emergency Plan for AIDS Relief
PERSUAP	Pesticide Evaluation Report and Safe Use Action Plan
PLITM	Prince Leopold Institute of Tropical Medicine
PLWHA	people living with HIV/AIDS
PMI	President's Malaria Initiative
PMTCT	prevention of mother-to-child transmission
PNILP	National Malaria Control Program
PSI	Population Services International
PV	pharmacovigilance
QA/QC	quality assurance/quality control
RBM	Roll Back Malaria
RDT	rapid diagnostic test
RPM+	Rational Pharmaceutical Management Plus Project
REMA	Rwanda Environmental Management Authority
RTI	Research Triangle Institute
SBM	Standards Based Management
SEA	Supplemental Environmental Assessment
SPA	Service Provision Assessment
TRAC+	Treatment and Research AIDS Center (TRAC *Plus*)
U5	under-five years of age

Executive Summary

Rwanda has been selected as one of the four countries to receive funding during the second year of the President's Malaria Initiative (PMI). The objective of this Initiative is to assist African countries, in collaboration with other partners, to rapidly scale up coverage of vulnerable groups with four highly effective interventions: artemisinin-based combination therapy (ACT), intermittent preventive treatment for malaria in pregnancy (IPTp), insecticide-treated mosquito nets (ITNs), and indoor spraying with residual insecticides (IRS).

Malaria is the overall leading cause of morbidity and mortality in Rwanda and the government is highly committed to fighting the disease, with a strong National Malaria Control Program (French acronym, PNILP) and recently developed comprehensive five-year strategy. The PMI in Rwanda will work closely within this strategy, allowing programs and interventions to be rapidly scaled up and strengthened. Currently, the Belgian Technical Cooperation (BTC) is the largest external financier of malaria programs in Rwanda. Rwanda is also the recipient of Round 3 ($17 million) and Round 5 ($39 million) malaria grants from the Global Fund to Fight AIDS, Tuberculosis, and Malaria (GFATM). The grants from the GFATM cover many of the country's commodity needs (including ACTs for health facilities and a large portion of ITNs), though gaps exist, as are outlined in this document.

This PMI Year 1 Malaria Operational Plan for Rwanda was developed in close consultation with the PNILP and with participation of many national and international partners involved in malaria prevention and control in the country.

To achieve the targets of the PMI in Rwanda, the following major activities are proposed for the $17 million of funding during Year 1 of the Initiative:

1. Support IRS in 5 districts, including equipment, insecticide, building IRS capacity at sector, district, and national levels, preparation of IRS guidelines and protocols, and IEC/BCC (planned coverage of rural, urban, and periurban areas) ($4,358,000);
2. Increase coverage of target groups with long-lasting ITNs (LLINs) and develop capacity for evaluation of LLIN coverage in order to forecast replacement needs ($3,450,000);
3. Introduce home-based management of fever (HBMF) with ACTs into 14 districts (12 existing HBMF districts and two new) ($3,791,000);
4. Increase demand for strengthened and integrated antenatal care (ANC) services, improve quality of ANC services, and procure sulfadoxine-pyrimethamine (SP) and iron-folate for IPTp and ANC ($580,000);
5. Introduce provision of ACTs through the private sector ($1,498,000); and,
6. Strengthen drug quality assurance and commodity distribution systems ($543,000).
7. Strengthen and support laboratory diagnostics capacity for malaria through the National Reference Laboratory and the PNILP ($260,000).

The President's Malaria Initiative

In late June 2005, the United States Government (USG) announced a new five-year, $1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions in high-burden countries in sub-Saharan Africa. The goal of this Initiative is to reduce malaria-related mortality by 50% after three years of full implementation in each country. This will be achieved by reaching 85% coverage of the most vulnerable groups---children under five years of age, pregnant women, and people living with HIV/AIDS---with proven preventive and therapeutic interventions, including artemisinin-based combination therapies (ACTs), insecticide-treated bed nets (ITNs), intermittent preventive treatment of pregnant women (IPTp), and indoor residual spraying (IRS).

The President's Malaria Initiative (PMI) began in three countries in 2006: Angola, Tanzania, and Uganda. In 2007, four countries were added: Malawi, Mozambique, Senegal, and Rwanda, with additional countries to be added in 2008. Funding began with $30 million in Fiscal Year (FY) 06 for the initial three countries, and will increase to $135 million in FY 07, $300 million in FY 08, and reach $500 million in FY 10 in 15 countries by 2010.

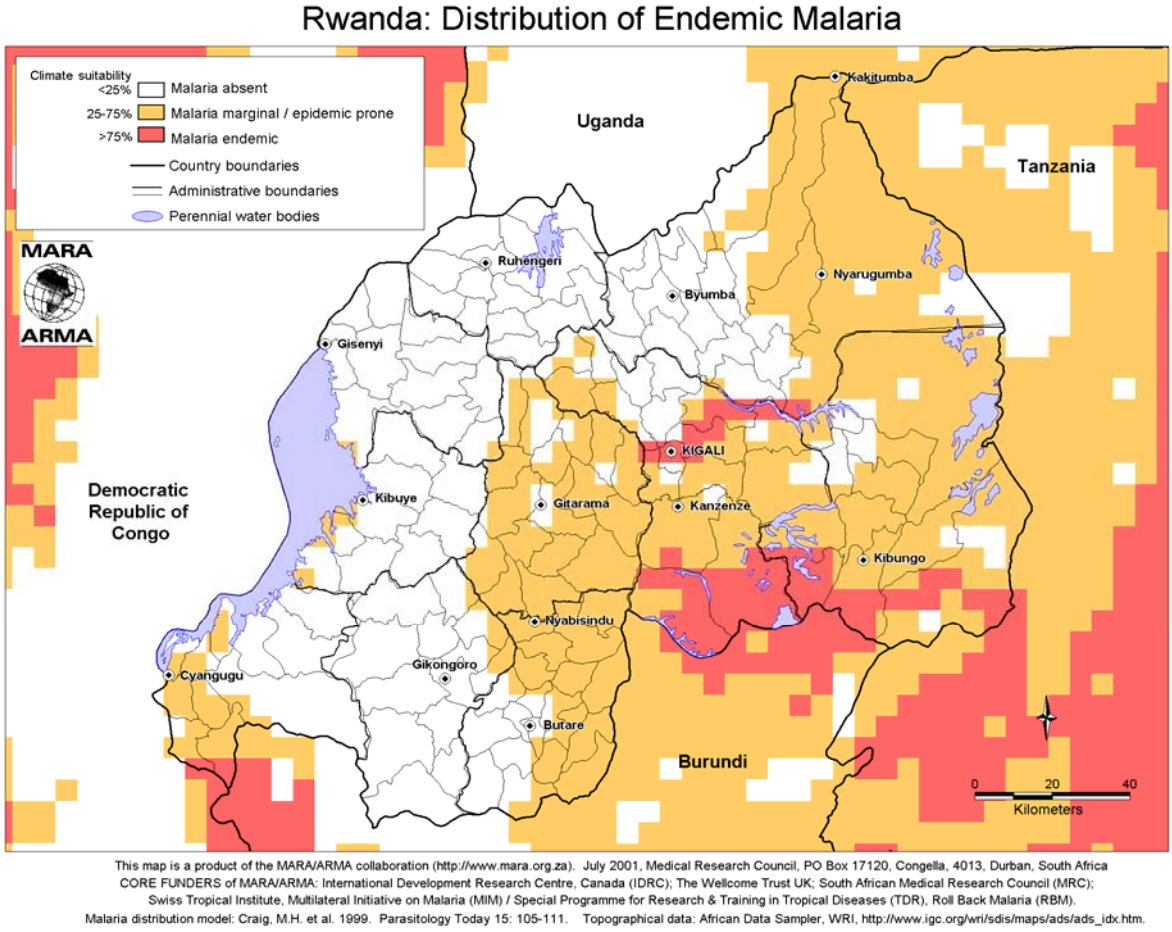
In implementing the U.S. Government component of this Initiative, the U.S. is committed to working closely with host governments and within existing national malaria control plans. Efforts will be coordinated with other national and international partners, including the Global Fund to Fight AIDS, Tuberculosis, and Malaria (GFATM), Roll Back Malaria (RBM), the World Bank Malaria Booster Program, and the non-governmental and private sectors, to ensure that investments are complementary and that RBM and Millennium Development goals are achieved. Country Assessment and Planning sessions for the PMI, as well as subsequent evaluations, will be highly consultative and held in collaboration with the national malaria control program and other partners.

This document presents a detailed one-year implementation plan for the first year of the President's Malaria Initiative in Rwanda. It briefly reviews the current status of malaria control and prevention policies and interventions in Rwanda, identifies challenges and unmet needs if the goals of the PMI are to be achieved, and provides a description of planned Year One activities under the PMI. The document was developed in close consultation with the National Malaria Control Program (PNILP) and with participation of many national and international partners involved in malaria prevention and control in the country. The total amount of PMI funding requested for Rwanda is $17 million for FY 2007.

Malaria Situation in Rwanda

Geographically, malaria transmission in Rwanda has increased over the last ten years for a myriad of reasons. The spread of transmission may be attributed to increased chloroquine resistance (previously the most common form of malaria treatment), greater population density and population movements, and human and economic activities such as rice farming, brick

making and mining, which increase breeding areas for mosquitoes and thus increase the risk of malaria transmission. Malaria is now evident in high altitude areas and other areas where the disease was not previously a public health problem. Often, inhabitants of these areas have little or no immunity to the disease and are therefore prone to severe forms of malaria. Since 1998, severe epidemics/upsurges of malaria have been observed nationwide almost every two years.



Health facility data show that malaria is the overall leading cause of morbidity and mortality in Rwanda, responsible for up to 50% of outpatient attendance. More than 1.2 million episodes of uncomplicated malaria were treated in public sector health centers during 2004. In 2005, this figure increased to over 1.5 million. However, this number significantly under-represents the total number of annual episodes in the population since only 32% of the population utilized health services during the same period. It is difficult to separate the extent to which growth in case load is attributable to an increase in malaria transmission levels or effective behavior change communication (BCC) campaigns and community health insurance schemes that have created greater demand for health service.

Based on the most recent country estimates, the number of children under five (U5) is 1,550,000 and the number of pregnant women per year is 390,000. In addition, according to PEPFAR figures, there are approximately 188,000 people living with HIV/AIDS (PLWHA). With 34.3% of health facility deaths among children under five attributable to malaria, the disease is the

leading cause of death for this age group. In 2004, over 23,790 cases of severe malaria were recorded in the district hospitals with 1,353 deaths. Fifty-four percent of hospital cases and 53% of the deaths occurred among children U5 [1]. Malaria is also a significant health risk for pregnant women and their unborn children, particularly women in their first and second pregnancies, and women with HIV infection.

Malaria is known to exact a significant financial toll on household income and government revenue. In Rwanda, the direct cost per episode of malaria treated is estimated to be $2.09 while the indirect cost is over $5.00. With the majority of children and many adults experiencing more than one episode per year, malaria impedes economic development. Financial calculations do not fully capture lost productivity and opportunity costs of the disease. A person suffering from malaria will miss an average of eight days of work or school.

The 2005 Demographic and Health Survey (DHS) conducted between February and July of 2005 showed weak case management practices for malaria in children U5. Among caregivers who reported having a child with fever in the two weeks before the survey, only 12.3% of children received an anti-malarial drug and only 2.5% had received treatment within 24 hours. In addition, only four to six percent of those children were given a recommended drug (combination amodiaquine-sulfadoxine-pyrimethamine (AQ/SP) or quinine). In three districts studied in 2005, only 21% of persons with uncomplicated malaria and 44% of patients with severe malaria were managed correctly in health facilities, and only 59% received a recommended drug.

Use of preventive measures at the household level is also inadequate. Rwanda experienced modest gains in ITN ownership between 2000 and 2005, but coverage remains relatively low. Overall ITN coverage increased from 6.6% to 14.7%, use by children U5 rose from 4.3% to 13.0%, and use by all women from 3.9% to 10.5%. In 2005, 17.2% of pregnant women slept under an ITN (not queried in 2000 DHS). The 2005 DHS found only 18.2% of households with at least one net of any type, and only 14.7% with at least one ITN.

The analysis of malaria-related funding in the 2003 National Health Accounts showed that 18% of all health expenditures in Rwanda (total Rwandan Francs, RwF, 11.1 billion) were spent on malaria prevention, treatment, and control. Sixteen percent of all donor health funds, 13% of all public health funds, and 26% of all private health funds went towards malaria efforts. Currently, the primary external supporters of the PNILP are the GFATM and the Belgian Technical Cooperation (BTC). UNICEF, WHO, the German Development Bank (KfW), and the Swiss Cooperation have also been engaged in malaria activities in Rwanda.

Rwanda is the recipient of Round 3 and Round 5 Malaria Grants from the GFATM. Implementation of Round 5 is underway and approval has recently been received to begin phase 2 of the Round 3 grant. The GFATM is funding prevention and treatment activities, including procurement of LLINs which were distributed primarily through the national measles campaign in September 2006 and of ACTs which were made available to all age groups in public sector health facilities as of October 2006.

[1] Source : Ministry of Health, Health Information Management System (SIS), Planning Unit

Round	Grant Start Date	Total Funding Request	Phase 1 Approved	Phase 2 Approved	Disbursed
3	1 Oct 2004	$17,676,232	$13,045,293	$4,630,939	$13,045,293
5	1 Mar 2006	$39,649,362	$28,140,771	$0	$14,935,348

National Malaria Control Strategy and Plan

PNILP has strong leadership and has recently developed a strategic plan that will cover 2006 – 2010. The objectives of the National Plan, similar to those of the PMI, are to ensure:

- Prompt, appropriate, and affordable treatment for 80% of children <5 years of age with malaria within 24 hours of onset of symptoms, through health centers and home-based management of fever (HBMF).
- Access to IPTp for 80% of pregnant women.
- At least 80% of pregnant women and children under five sleeping under an ITN.
- At least 90% of malaria patients who attended health facilities are treated in conformity with the national policy.
- At least 90% of malaria epidemics are identified and controlled within 2 weeks of outbreak.

The current status of each key intervention is further explained in subsequent sections. The national plan also addresses the need to reinforce coordination with partners (both intra-governmental as well as international), develop human resource capacity particularly with the decentralization process and restructuring of the MOH at central level, strengthening IEC and advocacy, and supporting monitoring and evaluation and operational research.

Current Status of Malaria Indicators

At the time of the PMI plan development in July - September 2006, data on the national coverage of malaria interventions were available from the DHS 2005. However, the impact of activities supported by the PNILP that were rolled out after the DHS or were anticipated to begin in late 2006 was not reflected in these results. Such PNILP activities included the initiation of IPTp strategies at health facilities based on the new national policy, the nationwide distribution of ITNs through an integrated measles–ITN campaign, and the introduction of ACTs to all government health facilities nationwide. Hence, in order to develop the PMI strategy for year 1, yet anticipate that additional progress toward achieving the national malaria goals will have been made before the implementation of PMI supported activities, this PMI plan uses the DHS 2005 results to develop the plan framework, but will use other appropriate data sources (e.g., Multiple Indicator Cluster Surveys planned for 2007) as the baseline for the PMI.

Indicator	**Urban**	**Rural**	**Total**
% of households with at least one ITN	31.6	11.8	14.7
% of households with more than one ITN	13.9	2.5	4.2
% of children who slept under an ITN the previous night	25.7	10.9	13.0

% of pregnant women age 15-49 who slept under an ITN the previous night	28.6	15.5	17.2
% of women who received IPTp with at least two doses of SP during pregnancy	0.6	0.2	0.3
% of children under age five with fever in the two weeks preceding the survey	25.3	26.4	26.2
% of children under age five with fever who took antimalarial drugs same or next day	1.3	2.7	2.5

Source: DHS 2005

Goals and Targets of the PMI

The goal of PMI is to reduce malaria-associated mortality by 50% compared to pre-initiative levels in all PMI countries. By the end of 2010, the PMI will assist Rwanda to achieve the following targets in populations at risk for malaria:

- >90% of households with a pregnant woman and/or children under five will own at least one ITN;
- 85% of children under five will have slept under an ITN the previous night;
- 85% of pregnant women will have slept under an ITN the previous night;
- 85% of houses in geographic areas targeted for IRS will have been sprayed;
- 85% of pregnant women and children under five will have slept under an ITN the previous night or in a house that has been sprayed with IRS in the last 6 months;
- 85% of women who have completed a pregnancy in the last two years will have received two or more doses of IPTp during that pregnancy;
- 85% of government health facilities have ACTs available for treatment of uncomplicated malaria; and
- 85% of children under five with suspected malaria will have received treatment with an antimalarial drug in accordance with national malaria treatment policies within 24 hours of onset of their symptoms.

Expected Results – Year One

Prevention:

1. At least 500,000 LLINs will have been distributed by partners to families with children under five and/or pregnant women to support achievement of nationwide household ownership of ITNs of >50%.
2. At least 85% of houses (approximately 145,000 households) in geographic areas targeted for IRS during Year 1 will have been sprayed.
3. Intermittent preventive treatment with SP in pregnant women (IPTp) will have been implemented nationwide in all 30 districts reaching approximately 195,000 pregnant women (50% of target population) with 2 or more doses of IPTp.

Treatment:

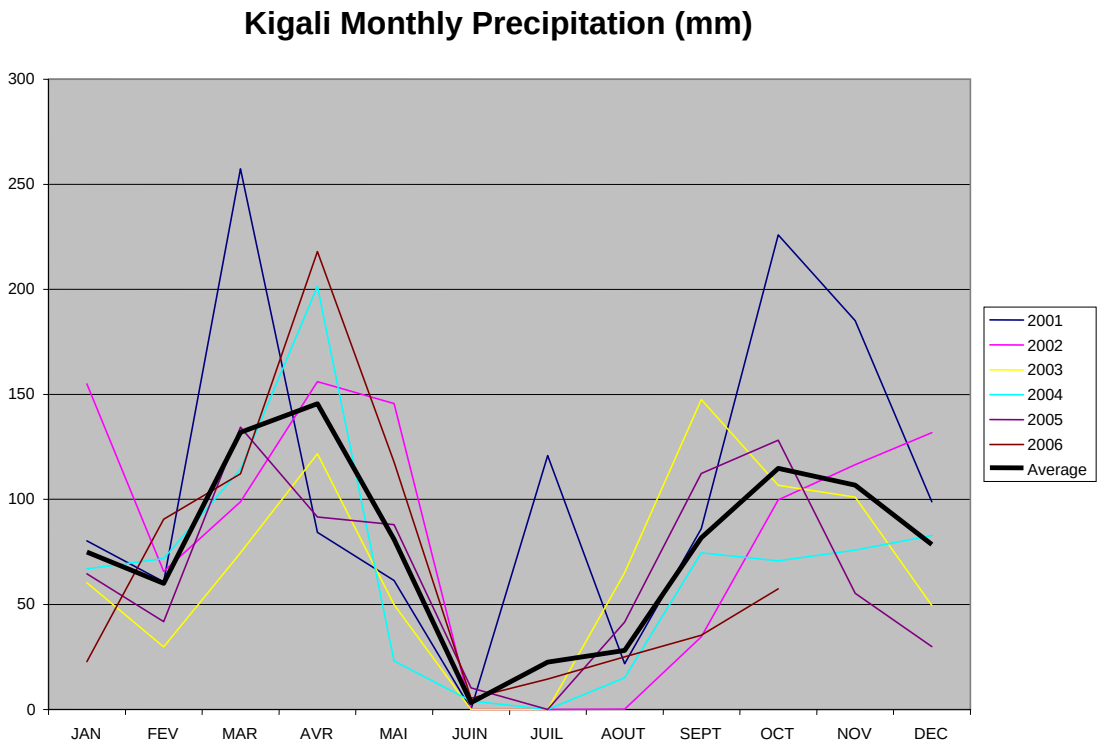
1. Sixty thousand treatments of injectable artemether will have been made available in public health facilities to cover the annual projected cases of severe malaria requiring referral to a higher level of care.
2. Malaria treatment with ACTs will have been implemented at the community-level through home-based management of fever in 5 districts.
3. Malaria treatment with ACTs will have been initiated in the private sector by reaching approximately 50 accredited pharmacies and drug outlets.

Interventions: Prevention

Indoor Residual Spraying (IRS)

Current Status:

PNILP supports the use of IRS although large-scale preventive IRS was not included in the national strategy due to cost considerations. IRS is, therefore, used on a limited basis in response to malaria epidemics and unusually high 'seasonal peaks' in malaria illness. There are two main rainy seasons in Rwanda; the first occurs between the months of February and April and the second falls between the end of September and beginning of November. Meteorological data provided by the Rwanda Meteorological Services (table below) illustrates the monthly precipitation for Kigali between 2001 and 2006.



In spite of limited institutional experience with the large-scale use of IRS, there is considerable interest and support at all levels for the development of national IRS capacity. A proposal for activities in the area of malaria epidemic prevention, developed with support from the Belgian Prince Leopold Institute of Tropical Medicine, in 2003, discusses district-level IRS. There has been some operations research on the use of the pyrethroid insecticides lambda-cyhalothrin and bifenthrin. Since the 1980s, IRS has been used as a control/prevention measure for epidemic malaria. A step-wise scale-up approach is favored to gain experience prior to taking the intervention to a national scale.

Problems with epidemic response capability include logistics and timely prediction. Data gathered by the National Meteorological Service (NMS) is not reported to PNILP; currently the PNILP epidemic triggers are based on increases in facility case load that exceed normal seasonality rather than climatic determinants such as precipitation, temperature, and humidity. There is a need for routine data analysis to establish by district the relationships between climatic conditions, vector density and generalized immunity that will vary with exposure. Although the NMS lost an extensive network of weather stations during the 1994 Genocide, the NMS is willing to monitor district-level meteorological data for PNILP.

Proposed USG Component:

The PMI will support IRS in five districts in Year 1. Procurement of supplies and equipment for all five districts and completion of spraying in three of these will occur in 2007. Early in 2008, the remaining two districts will be included in the spraying round. This phased approach will allow for the strengthening of PNILP central- and district-level capacity for routine spraying and a gradual phasing of IRS activities on a wider national scale. The first phase of spraying, which would provide a first round of spraying in three districts, would likely take place in July and August of 2007 before the second rainy season in September. The second phase of spraying, in January 2008, would provide a second round of spraying in the original three districts and a first round in two additional districts.

PNILP has suggested the following five target districts for IRS activities: Kirehe, Nyarungenge, Gasabo, Kicukiro, and Nyanza, reaching a total population of approximately 1,259,868. With IRS costs budgeted at $3.00 per person per spraying round, the total estimated cost for IRS activities covering the proposed two rounds of spraying is approximately $5.8 million. The five districts represent rural, urban, and periurban populations. Nyarungenge, Gasabo, and Kicukiro were chosen due to high malaria endemicity and high population density, ease of access, and proximity to Kigali. IRS support will include capacity building for IRS implementation at national, district, and sector levels, baseline data collection and monitoring and evaluation, protocol and guideline development, procurement of related logistics and equipment, and support to the MOH and partners in BCC/IEC.

PMI will coordinate with BTC and GFATM for the next phase of IRS activities as there may be interest in co-funding these activities in future years. In addition, there are several training institutions and partnerships that could be drawn on to increase capacity for IRS activities: (1) Tulane University's cooperative agreement with USAID to support the Rwanda National University's School of Public Health; (2) USAID's bilateral project "Twubakane" which

strengthens MCH service delivery at the district level; (3) Medical Research Council (MRC), University of Cape Town for regional support; and (4) current partners of Belgian Technical Cooperation (BTC), the Prince Leopold Institute of Tropical Medicine (PLITM) and the London School of Hygiene and Tropical Medicine (LSHTM) at the international level. PMI is also proposing to support graduate level training in entomology to further strengthen capacity in country (discussed in the Capacity Building section).

Proposed Activities for Year One:

Activity	Description	Cost ($000)
Phase 1: IRS implementation in 3 districts, including equipment procurement and supporting activities	Spray equipment, insecticides, training of IRS spray teams and supervisors, and community health workers in M&E, strengthening of IRS malaria information system, collection of baseline information for IRS implementation, IRS preparation, protocol/guidelines development, Pesticide Evaluation Report and Safer Use Action Plan (PERSUAP), Supplemental Environmental Assessment (SEA) and rainfall data and seasonal variations, IRS implementation, and BCC/IEC activities.	2,050
Phase 2: Second round IRS in the 3 districts from Round 1 and first round spraying in 2 additional districts	Same activities as listed above for Round 1 except for costs associated with spraying equipment in 3 districts and the environmental assessments. PMI proposes to cover all commodity costs plus some additional activities for Round 2 in the first year budget, and the remaining balance would be applied to the second year budget.	2,308
Entomology training	Post-graduate training in entomology and mid-level management.	150
Total cost		**4,508**

Insecticide-treated Nets (ITNs)

Current Status:

PNILP's 2005-2010 Strategic Plan calls for increased LLIN coverage targeting pregnant women and children U5, reaching 80% by 2010. The PNILP also wants to provide nets to the poorest of the poor Rwandans (those in the lowest income quintile). With regard to PLWHAs, the basic package of services provided under existing PEPFAR programs calls for provision of LLINs to both adults and children. There are an estimated 188,000 PLWHAs who should receive LLINs under the plan. In 2007, nets for PLWHAs will be covered by the GFATM. Current LLIN distribution mechanisms include:

1. ANC centers;
2. Routine vaccination sites to begin at the end of 2006;

3. PLWHA organizations;
4. Social marketing/commercial sector; and
5. National measles vaccination/LLIN distribution campaign (September 2006).

In order to reach target groups that currently have coverage levels lower than 90% with LLINs, PMI is exploring other opportunities for LLIN distribution and promotion. There is potential for promotion through community health insurance schemes (mutuelles) which are able to target the poorest of the poor and organizations that provide pre-marital counseling to protect women during their first pregnancy. In 2005, a total of 233,500 LLINs were distributed nationally (48% through the private sector, 46% through the public sector, and 6% through civil society organizations).

The price structure for nets is as follows: 200 RwF ($0.36) in health facilities for pregnant women and children U5; free in campaigns; 600 RwF ($1.09) through social marketing for rectangular and 1900 RwF ($3.45) for conical (though this price will be reduced to 1000 RwF [$1.82] in the near future). According to the PNILP, LLINs and other public health products/medical supplies required for malaria prevention and control are exempt from taxes and tariffs.

The DHS 2005 showed ITN use figures for Kigali at 32.2% and ranging from 7.9% to 16.0% for the North, East, South, and West regions. Most nets currently in use are not LLINs and require re-treatment every six months. Under Round 3 of the GFATM, 375,000 re-treatment kits were purchased for this purpose. The kits are distributed by CAMERWA, the Central Drug Purchasing Agency for Rwanda, Population Services International (PSI), and community- and faith-based organizations. Non-LLINs will be phased out and replaced by large stocks of LLINs. While less expensive non-LLINs remain available commercially, public recognition of the added value of LLINs over conventional nets is growing. BCC/IEC messages are important to reinforce this concept and to differentiate among products.

The following three tables show the projected need as estimated by PNILP for LLINs in order to achieve greater than 90% household ownership (with 2.5 nets per household), the LLINs currently available due to GFATM commitments, and the resulting gap, which is approximately 780,000 nets.

Projected LLIN Need

Population	**Households (Estimated 5 people per household)**	**# of LLINs (2.5 per household)**	**# of LLINs needed for >90% ownership**
9,100,000	1,820,000	4,550,000	4,095,000

Available LLINs from the GFATM

GFATM Round 3 provided 1,050,000 LLINs.	1,050,000
GFATM Round 5 is providing 1,421,837 LLINs in first year and 737,892 LLINs in the second year of the grant.	2,159,729
KfW (German Development Bank)	100,000
Total	3,309,729

LLIN Estimated Gap

LLINs needed for >90% of households	4,095,000
LLINs available in-country	3,309,729
Total LLIN Gap	785,271

Proposed USG Component:

PMI proposes to address the LLIN gap in the first year by purchasing 450,000 LLINs, moving towards achieving over 90% coverage over the next three years, and reaching all PNILP target groups (children under five years, pregnant women, poorest of the poor), except PLWHAs. The cost of nets to PLWHAs is expected to be covered by the GFATM and other partners. The projected cost per LLIN is $7.00. To address shortfalls in LLINs as well as their transportation and distribution, PMI will strengthen distribution systems including CAMERWA, which serves as the national clearance and storage center for nets, and strengthen BCC/IEC programs at national, district, and local levels.

Included in this total of 450,000 nets, PMI intends to distribute approximately 110,000 LLINs in one district to support a Year 2 formative evaluation of optimal IRS & ITN use. These LLINs will be distributed in conjunction with Round 2 IRS activities with the aim of ensuring 100% household ownership and protection in this district. The long-term success of any malaria control strategy depends on sustainability. A combination of IRS immediately followed by an LLIN distribution and/or installation campaign could be a means to sustain initial gains in the absence of annual IRS campaigns. However, this 'one-two punch' approach has not been evaluated. The PMI support for both strategies presents an opportunity for a public health evaluation. PMI will consider evaluating the 'one-two punch' approach of an IRS campaign as a means to sustain IRS impact, and include an analysis of the cost-benefit of the 'IRS only' intervention.

Proposed Activities for Year One:

Activity	**Description**	**Cost ($000)**
LLIN procurement	Procure 450,000 LLINs for distribution through existing delivery mechanisms (e.g. ANC visits, routine vaccinations, annual nationwide campaigns and mutuelles) to ensure >90% protection of target groups as well as 100% protection in one district to support a formative evaluation of optimal IRS & ITN use	3,150
Strengthen LLIN transport systems	Strengthen CAMERWA's new active distribution system to include LLINs distributed to district and community levels, prevent stock-outs and leakage (through truck rental).	150
BCC/IEC	Promote proper use of LLINs among children	150

	U5, pregnant women, and PLWHAs through targeted campaigns, community mobilization and advocacy	
Total		**$3,450**

Interventions: Case Management

Malaria Diagnostics

Current Status:

In 2004 and 2005, about 45% of malaria cases reported nationwide were laboratory confirmed, generally through reading of Giemsa-stained thick blood films. The PNILP introduced treatment with artemisinin-based combination therapy, artemether-lumefantrine (AL or Coartem®), in October 2006. In order to ensure rational use of Coartem and prevent emergence of resistance, PNILP wants to increase laboratory confirmation of febrile illness. According to new treatment guidelines, clinical confirmation by microscopy or rapid diagnostic test (RDT) is required before treatment of adults and older children in all transmission areas. Treatment of children U5 continues to be done based on presumptive diagnosis irrespective of transmission patterns.

PEPFAR has invested significantly in upgrading many health center and district hospital laboratories; in most cases, this has included a microscope. GFATM has purchased 172 microscopes which, coupled with PEPFAR investments, will ensure that all health facilities will have a microscope. GFATM has also supported some lab technician training. A quality control system is in place in which approximately 15% of slides are saved and reread by district level staff as part of laboratory supervision. It is not clear if this system of quality control is in fact widely implemented.

RDTs are not yet widely used in Rwanda, however, the use of RDTs has been included in the National Guidelines for Management of Malaria. GFATM has allotted $120,000 to purchase 141,000 RDTs under Round 3, Phase 2. PNILP has made the use of RDTs a priority in the following circumstances: 1) zones where transmission is moderate to weak, 2) case confirmation in malaria epidemics, 3) assessment and follow-up of the cases of severe malaria, and 4) assessment of therapeutic failures. Further development of a national strategy for the use of RDTs merits additional attention before their widespread use.

Alternative sources of power/light (such as the “EARL Light”) are needed as electricity is not continuous in many health facilities. A rapid assessment of microscopy diagnosis technical capacity is also needed in a representative number of health facilities in order to gain a better understanding of needs for refresher training and supervision being considered by PNILP.

Proposed USG Component:

PMI will assess laboratory needs and provide laboratory support for malaria diagnosis in the following areas: (1) improving the malaria diagnostic capacity and RDT techniques to reinforce the national quality assurance/quality control program, (2) developing an adequate, sustainable

system for in-service training of laboratory technicians in malaria diagnostic techniques, (3) supplying essential equipment/materials for district/peripheral laboratories not already funded by other donors, and (4) supporting the development of an algorithm and the implementation of the rational use of RDTs. A comprehensive assessment of lab quality services in early 2007 through a national Service Provision Assessment is planned. All laboratory activities will be coordinated with PEPFAR, GFATM, and BTC.

Proposed Activities for Year One:

Activity	**Description**	**Cost ($000s)**
National QA/QC protocol and program development	Initial or refresher training for 300 lab technicians in microscopy and, as applicable, RDT use (e.g. logistics, training supplies and materials, lodging, per diems) (Malaria laboratory capacity and quality of services assessment will be integrated into the Services Provision Assessment 2007; see M&E section.)	45
Support for National Reference Laboratory to improve malaria diagnostic capacity	Support supervision at the central level, transportation/fuel for supervisory visits from national reference to districts (30 districts for 4 visits per year)	85
Human resources capacity building	Reinforce malaria diagnosis training at the national teaching institutions, support for laboratory technicians in areas with critical shortages	60
Equipment and supplies for district and peripheral laboratories	EARL lights (battery powered long lasting light source), slides, microscopes, reagents	20
Reinforcing laboratory diagnosis with RDTs	Support PNILP in the development of the rational use algorithm and preparation for implementation of RDTs in malaria diagnosis	50
Total		**260**

Facility-based Case Management

Current Status:

Malaria Treatment: National Policy

The current malaria treatment policy for uncomplicated malaria is presumptive treatment with combination AQ/SP. Data from drug efficacy studies conducted by BTC and PNILP have demonstrated the emergence of AQ/SP resistance with treatment failure rates that range between 15-50% depending on the site in country. In order to address these treatment failure rates and to preserve the efficacy of SP for preventive treatment during pregnancy, the MOH decided in July 2005 to introduce Coartem as first-line treatment for uncomplicated malaria. As of October 2006, all public health facilities transitioned to treatment with Coartem for uncomplicated

malaria and for malaria in the second and third trimesters of pregnancy. Oral quinine is recommended for women in their first trimester of pregnancy. For greater specificity of diagnosis and reporting, the PNILP has modified the WHO classification to simple malaria to allow for a new class, "uncomplicated malaria with minor enteric disorders." In the past, these cases would have been referred to higher level of care with risk of progressing to severe malaria in transit. The PNILP recommends that these cases be stabilized at the health center level using injectable artemether, followed by referral and Coartem treatment once the patient can tolerate oral medication. The pre-referral treatment for severe malaria is presently quinine administered either intravenously or through rectal administration. Severe malaria is treated with intravenous quinine followed by oral Coartem. The national plan promotes home-based management of fever (HBMF) for children U5 through trained community health workers (CHW) with AQ/SP in targeted endemic districts.

Pharmaceutical Management: ACT Transition

An estimated 35% of malaria cases are treated in health facilities. This is expected to rise to 60% as ACTs become widely available (Coartem is already registered and on the Essential Drugs List). PNILP has a comprehensive implementation plan to guide transition to the use of AL at health facilities and has also developed treatment guidelines and revised training materials. Implementation of the new policy will be phased, based on availability of drug and readiness of districts. ACTs will be available at district health facilities nationally by October 2006, while ACT availability at the community level will begin in 5 districts and scale up to 22 meso- and hyper-endemic districts by mid-2008. The remaining stocks of adult dosage AQ/SP will be destroyed, while the pediatric formulations will be held in reserve for HBMF in those districts that have not yet transitioned to the new ACT policy at the community level. National facilitators have been trained with support from WHO and other partners, and additional trainings (e.g. training of trainers, cascade training) for health workers are planned through October.

Proposed USG Component:

Funding from GFATM Round 5 provided adequate quantities of Coartem for facility-based health centers covering all age groups until September 2009, and GFATM Round 3, phase 2 will provide quinine for 2007. However, there are currently no provisions for the purchase of injectable artemether under the GFATM. The calculated number of treatments needed to treat uncomplicated malaria cases with minor enteric disorders nationwide for a two-year period is approximately 120,000 treatments. USAID/Rwanda will use FY 06 malaria funds to purchase the required supply of injectable artemether for the first year (60,000 treatments) in order to have a continuous stock available before FY 07 funds are disbursed. Additional support for ACT compliance monitoring at the facilities is addressed in the M&E section of the PMI plan.

Proposed Activities for Year One:

Activity	**Description**	**Cost ($000)**
Procurement of injectable	60,000 treatments for use in the pre-referral treatment	125

artemether	of children under-5 using injectable artemether, and Coartem treatment once the patient can take oral medication	
ACT treatment compliance	Reinforcement of recent ACT transition training with job aids on ACT treatment protocols, counseling cards and language appropriate brochures for clients, and enhanced supervision of the quality of treatment.	200
PNILP Supervision	Support to PNILP for supervision and follow-up on prevention and case management activities through leasing/rental of transportation.	150
Total		**475**

Drug Supply and Management

Current Status:

Pharmaceutical Management: Drug Procurement and Distribution

The MOH currently procures antimalarials and supplies for health facilities through two main providers. The first is the Centrale d'Achat des Medicaments Essentiels au Rwanda (CAMERWA), an autonomous non-profit organization considered to be the national medical store for Rwanda currently procuring 60% of health facility drugs and supplies. In 2004, a larger proportion of its funds came from its own resources and additional support from the GFATM. The second provider is BUFMAR, another autonomous non-governmental and non-profit organization set up by faith-based organizations (FBOs) in Rwanda. In 2004, BUFMAR covered 70% of its funds while FBOs covered the remaining 30%.

Medicines for Rwanda's primary care system are managed through a "pull" system with transportation provided to district level warehouses. The pull system extends down to the peripheral levels where health facilities pick up their stocks from the warehouse and community health workers replenish their stock of medications from the health facility. Each district pharmacy determines the quantities of medicines to be ordered based on the recommended standard treatments for the key priority conditions and the number of patients expected to be treated within a given time frame. However, the supply chain of CAMERWA from the central- to community-levels is limited in capacity and does not have the capability to prevent routine stock-outs of essential drugs. The district level pharmacy systems are weak with some not yet in place as a result of the new districts. Strengthening distribution systems to the district level is vital to ensuring an adequate supply chain system and avoiding stock-outs.

Regulation

In 2005, there were several Ministerial decrees specific to pharmaceutical industry. These included the formation of a national committee, the Pharmacy Taskforce (PT), to oversee pharmacy retailers with responsibilities for quality control, inspection, licensure, and ensuring a basic package of pharmaceutical products. A list of these products has been developed, and is reviewed annually. Drug importation laws have been revised recently to ensure quality control

upon receipt. Visas and import licenses are issued by the PT only after certification and other requirements are met by the exporter. Requirements include documentation of manufacture, wholesale, and export of pharmaceuticals' licenses, certification of good manufacturing and distribution practices, and accurate packing lists with batch numbers, manufacture dates, appropriate expiry dates (minimum of 2/3 the shelf life of the product), quantities of pharmaceuticals, and the country of origin. While the PT has the regulatory authority, capacity is nascent and will require support to carry out duties including quality control of incoming and circulating drugs.

Rational Use of ACTs

Algorithms for rational use of ACTs exist at the central level, although compliance is not well documented. In addition, there is, at best, limited knowledge of the new treatment protocols in the private sector.

Quality Assurance

CAMERWA procures drugs through tender invitation per internationally recognized quality assurance standards set forth by WHO (WHO Technical Reports 823 and 868). Sampling and laboratory verification of drugs is organized through WHO-qualified laboratories of South Africa and Niger. The PMI team did not observe any quality assurance activity between the district level and the health center level.

Drug Efficacy and Pharmacovigilance

In vivo drug efficacy monitoring has been ongoing under the East African Network for Monitoring Anti-malarial Treatment (EANMAT) agreement in selected sites in collaboration with Prince Leopold Institute of Tropical Medicine and London School of Hygiene and Tropical Medicine (LSHTM). Drugs tested include not only Coartem, but also potential alternate drugs, including dihydroartemisinin-piperaquine (Artekin®) and chlorproguanil-dapsone (Lapdap) plus artesunate. Regular monitoring of Coartem efficacy is planned.

A pharmacovigilance component specific to antimalarials is included in training manuals and a standardized form has been developed at the central level. Limited training in pharmacovigilance of ACTs will be conducted under the auspices of WHO; however, these resources are inadequate to establish a comprehensive pharmacovigilance system.

Proposed USG Component:

PMI will support CAMERWA to strengthen its commodity and distribution systems, including outsourcing of vehicle leasing, warehousing, and supervisory capacity at the provincial and district levels. Support will also be provided to health facility staff to facilitate timely commodity pickup. In addition, PMI will work with the PT to develop a pharmacovigilance system, train peripheral health facility staff, and update health facility supervision guidelines related to drug management. PMI will ensure provincial warehouses are able to receive stock equivalent to six months of estimated drug needs, and plan for CAMERWA to re-supply at the

provincial level at least twice a year. The provincial level will then be able to provide district and hospital pharmacies with quarterly stock. Health centers will place their orders each month through district warehouses.

Proposed Activities for Year One:

Activity	**Description**	**Cost ($000)**
Strengthening of commodity distribution system	Outsourcing vehicle leases (2 trucks and 4 '4x7' single-cabin transports) , supervisory personnel, training and staff provision for warehouse management at provincial and district levels, quality assurance in warehouse tracking, update training materials/tools, as well as support to district health centers.	488
Drug efficacy and pharmacovigilance	Strengthen PT pharmacovigilance system starting with existing sentinel sites; national workshop to standardize data collection. Training of peripheral health facility staff on identification and reporting side effects. Supervision and updating M&E pharmacovigilance system to include Coartem regimen, staff support for data collection.	55
Total		**543**

Home-based Management of Fever (HBMF)

Current Status:

Malaria Treatment: Home-based management of fever[2]

As the IMCI strategy remained stalled at the national level, the PNILP launched HBMF activities in six districts in 2004 based on a review of experiences in Ethiopia, Uganda, and Burkina Faso. There are several donors and partners supporting HBMF, including BTC, UNICEF, and grantees under the USAID Child Survival and Health Grants Program. Community-based distributors (CBDs) provide either AQ/SP presumptive treatment or health center referral for febrile children. The PNILP is interested in expanding HBMF based on preliminary success. An evaluation of this approach will be undertaken in late 2006. Simultaneously, PNILP wants to commence transition of presumptive treatment protocols at the community level to Coartem, with further plans to expand HBMF with AL to 22 meso- and hyper-endemic districts. However, no provision has been made for the procurement of AL, the costs of transitioning from AQ/SP to Coartem, and the expansion of HBMF to additional districts.

Proposed USG Component:

[2] References:

1) Plan strategique de prise en charge a domicile de la fievre/paludism au Rwanda, April 2004
2) Baseline survey of the Rwanda community distribution of anti-malarials pilot programe, CORE, August 20, 2004.

In an initial phase, PMI will assist the PNILP with the introduction of HBMF with Coartem in five districts, three of which are currently using AQ/SP and two districts where HBMF has not yet been introduced. The selection of the five Phase 1 districts will take into account both malaria burden and the level of parasite resistance to AQ/SP, prioritizing districts in which AQ/SP is least effective. To the extent possible these districts will host demographic surveillance sites and be among the first to benefit from the early introduction of IRS or be complemented by other malaria control interventions. This will allow the PNILP and the PMI to begin documenting the benefits of a full package of malaria interventions in several districts even before all interventions are taken to national scale.

Phase 2 will begin before the end of 2007 and will draw on lessons learned and recommendations from Phase 1 implementation as well as a post-Phase I evaluation. In Phase 2, the PNILP will change first-line treatment from AQ/SP to Coartem in the remaining nine districts currently implementing HBMF and introduce HBMF with Coartem in eight additional districts. Phase 2 will be completed in 2008. This will bring the total number of districts implementing HBMF with Coartem to 22. In the remaining districts, malaria transmission is either seasonal or unstable, and correct algorithmic diagnosis is less accurate as many fevers are likely to be associated with other infections, such as pneumonia. To coordinate these efforts, the MCH Taskforce of the MOH will lead introduction of the c-IMCI package in these districts.

In order to reinforce prompt and appropriate referrals for severe cases, the performance-based financing (PBF)[3] model, currently a national practice at health facilities will be extended to the community. PBF in HBMF will be implemented in the same five districts selected for initial roll out of HBMF using Coartem for Year 1 of PMI.

Proposed activities for Year One:

Activity	**Description**	**Cost ($000)**
Phase I	Introduce HBMF in 5 districts including Coartem procurement, training of health workers, supervision, logistical support, etc.	670
Phase II (2007)	Change first-line drug in HBMF from AQ/SP to Coartem in 9 districts including Coartem procurement.	1,345
Phase II (for 2008)	Procurement of Coartem for expansion to an additional 8 districts for 2008.	1,355
BCC/IEC	Adapt and print materials for community awareness and training in IEC/BCC.	150
Supervision	Skills update training for existing protocol and transition to Coartem.	271
Total for phased HBMF		**3,791***

[3] Components of PBF include BCC/IEC in the community about referral and appropriate and available medication, training CBDs in differentiating emergency cases and establishing linkages between CBDs, health facilities, emergency transportation providers as well as developing indicators for quality of referral.

Performance-Based Financing for Case Referral	Provision of incentives among CBDs for appropriate and timely referral of severe cases to health facilities	25
Total		**3,816**

*Total Coartem procurement is $1,620,000.

Private Sector Provision of ACTs

Current Status:

Approximately 60% of fevers among children U5 are treated outside of the public sector in Rwanda. In order to reach PMI targets, engagement of the private sector is essential. Nationally there are 38 accredited private pharmacies with employed pharmacists, 540 drug stores run by nurses, and 350-700 private clinics and dispensaries, although this number may have been greatly reduced in recent months following recent government efforts to closely regulate ACTs available in the private sector and the closure of some private outlets in rural areas. There are 23 different antimalarials available in Rwanda, including five artemisinin monotherapies (average $6 per treatment), three combination therapies (AQ/SP, artemether/SP, and AQ/artemether), SP monotherapy, AQ monotherapy, and others. Leakage of the public sector AQ/SP blister-pack to the private sector has been widely noted. Coartem is not yet available on the private market, but will be soon. Given the wide price differential between the traditional commercial price ($4 to $8) and the proposed public sector price of 200 RwF (about $0.36), there is tremendous potential for leakage from the public sector to the private sector.

PSI, in collaboration with the PNILP, plans to coordinate roll-out of Coartem in the public and private sectors in order to reach targets for prompt and efficacious treatment of children U5, reduce leakage of public sector Coartem to the private sector, and reduce inappropriate and inefficacious treatment being delivered in the private sector. This approach would be coordinated with the roll-out of Coartem in HBMF.

The expected sales price of Coartem at the health facility is 150-200 RwF ($0.27-$0.36) for a pediatric treatment and 300 RwF ($0.55) for an adult treatment. In the private sector it will be 250 RwF ($0.45) for a pediatric treatment and (at present) full market price for adult treatment ($2.40). Through HBMF it is anticipated to be priced at 150 RwF ($0.27). These are subsidized prices. Free provision of Coartem and other antimalarials has been ruled out as an option. Rwanda's innovative community insurance scheme seems to be working satisfactorily to reach those most at need and is expected to play a key role in the provision of health care.

Proposed USG Component:

Prepackaged treatments of Coartem will be procured through a central mechanism (TBD) and the roll-out of Phase 1 private sector provision of ACTs will be supported through PSI.
In the first year, Coartem will be distributed through Rwanda's 38 accredited pharmacies and through approximately 100 drug outlets focused in priority urban and periurban areas within the reach of commercial networks. Distribution would be expanded to further venues in later years if needed. The consumer price would be 250 RwF ($0.45).

Outlets will be selected based on a review process including assessment of quality standards (e.g. registration with MOH, quality of antimalarial products) as well as current treatment failure rates within the district, malaria endemicity, and distance from existing public sector and HBMF programs. Private sector providers will receive comprehensive training and a checklist for presumptive diagnosis, treatment and referral based on IMCI guidelines. Using a "seal of approval" incentive, participating outlets will be prohibited from importing and stocking monotherapies. Accredited outlets will benefit from marketing campaigns to encourage consumer utilization.

The London School of Hygiene and Tropical Medicine (LSHTM) will provide technical assistance in the area of M&E of social marketing of Coartem through the private sector outlets and other identified areas. Baseline and follow-up household surveys will be used to improve communication campaigns and build demand for and awareness of Coartem. These campaigns will focus on recognition of malaria symptoms, accessing treatment promptly and the importance of adhering to treatment.

Proposed Activities for Year One:

Activity	**Description**	**Cost ($000)**
Private Sector ACT implementation	Support procurement and distribution of pre-packaged Coartem through private channels including accreditation of private drug outlets, BCC/IEC, treatment/referral training, M&E	1,240
Procurement of ACTs	Procurement of Coartem	258
Total		**1,498**

Interventions: Prevention and Case Management of Malaria During Pregnancy (MIP)

Current Status:

Although 94% of pregnant women visit an ANC at least once, the median gestational age at first visit is six months, and only 43% of women make two or more ANC visits. While the national ANC strategy is consistent with WHO strategy (which calls for four ANC visits, one of which should occur before quickening), in Rwanda few women come for a first ANC visit in the first trimester. Advocacy is unlikely to change this situation in the near term, but targeted BCC/IEC campaigns, combined with innovative community- and facility-level PBF and growing enrollment in community health insurance schemes may prompt earlier ANC consultation. Failure to offer an integrated package of ANC services has resulted in a poorly perceived value of ANC, and consequently low demand. Community sensitization and mobilization regarding early ANC consultation remain weak.

Pre-service training guidelines state pregnant women are to receive a dose of mebendazole and a course of iron-folate for 30 days during their first ANC visit, although the timing and dosing of iron-folate remains unclear and the approach is not widely implemented. Pregnant women are counseled to purchase a LLIN at the subsidized price of 200 RwF at their first ANC consultation. At the time of the second visit, if a blood test suggests persistent anemia, additional iron-folate supplementation is provided. Pre-service training curricula, however, have not translated into MOH protocols at the national level. Pregnant women with symptoms of malaria are supposed to receive a blood film diagnosis. Treatment for simple malaria in the first trimester is quinine. Treatment in the second and third trimesters is with the current national first line treatment (AQ/SP), but will become AL with the change in treatment policy planned for October 2006.

Four separate programs of the MOH have a role in ANC: (1) HIV/AIDS (PMTCT), (2) EPI (tetanus vaccination), (3) Nutrition (iron/folate supplementation), and (4) PNILP (IPTp and provision of LLINs). These services are in addition to the fetal growth monitoring / birth preparation basic package. The MOH acknowledges that integration of services in ANC is poor and is consistently highlighted as the primary challenge to improving demand for and quality of ANC services. .

Health care worker training materials have been developed and reproduced regarding Focused Antenatal Care (FANC), which includes the control of MIP. Current FANC materials include a facilitator's guide (training-of-trainers manual), a participant training guide, and a reference manual for health care workers. Materials do not include HIV content. Between August 2005 and June 2006 an estimated 844 providers have been trained, representing two healthcare workers at every health facility in Rwanda (386 health centers and 36 district and referral hospitals).

In early 2005, the Rwanda MOH adopted a national policy related to MIP that includes provision of two doses of IPTp as directly observed therapy beginning in the second trimester. The policy is that there is no charge for SP when given as IPTp.

Although the 2005 DHS showed IPTp coverage to be less than one percent, recent internal PNILP figures estimate that 43% of women who come to ANC are receiving IPTp, due to a recent national rollout of ANC services. This estimate was gathered through a rapid special survey as routine information is not being sent through HMIS regarding the number of doses of IPTp that are administered to pregnant women.

The level of failure of SP for symptomatic 6-59 month olds is high (AQ/SP combination treatment failure rates in some areas are above 40%). However, the efficacy of SP among pregnant women in Rwanda is not known, although it is presumably better. With technical assistance from the PLITM, BTC is conducting a study of SP for IPTp, comparing it with placebo among 2,250 women who are also receiving an ITN at the time of enrollment. The protocol does not include verification of ITN use. This study, scheduled for completion at the end of 2007, is being conducted at three sentinel sites: Mashesha, Kicukiro (Kigali), and Ukara. Outcome measures include maternal hemoglobin, newborn weight, and placenta parasitemia. The results of this study could have important implications for future MIP planning in Rwanda,

as there is not currently another antimalarial drug with sufficient safety and efficacy data to be used for IPTp.

GFATM has provided training to providers in IPTp and purchased national supplies of SP through 2007. The Malaria Action Coalition has also provided resources for the development of FANC materials, training of trainers, training of providers, and salary support (through WHO) for an MIP advisor who sits both at PNILP and the MCH Taskforce. Funds for this post have been provided by USAID/Rwanda to ensure continuity in technical assistance for the next two years.

JPHIEGO completed a profile assessment report in June 2006; this report cites that a comprehensive MCH package (e.g. training materials, IEC materials including posters, job aids, and brochures) does not exist in Rwanda.

Proposed USG Component:

PMI will follow the MOH's desire to strengthen overall ANC services rather than providing support for specific MIP activities only. PMI will support the evaluation of current ANC services and development of a FANC package for Rwanda (including PMTCT). To this end, PMI will support updating supervision tools and training curriculum to reflect integrated services, ensure accurate data collection to support a "pull" system for SP, develop advocacy strategies to improve early ANC consultations, and help consolidate various MCH registers (including MIP indicators). PMI will also explore the roles of standards-based management (SBM) and PBF as methods for evaluating performance and improving quality of FANC services, and assist the newly formed MCH Task Force to focus on further integration of services through FANC.

The issue of community sensitization is crucial to increase demand for ANC services. Maternal CHW will be trained in the promotion of key FANC messages. Messages aimed at men, key decision-makers in households, will also be included in the strategy.

UNICEF and BTC have reached an agreement with PNILP to provide national coverage of iron/folic acid (IFA) through June 2007. UNICEF and BTC are also purchasing mebendazole. The milligrams in each tablet follow current technical recommendations regarding interaction between IFA and SP. BTC and PNILP would like the PMI to support the purchase of IFA for the following year, to be used as soon as the above supply is consumed. Because IFA reduces the adverse effects of malaria in pregnancy, the PMI considers support for IFA an important contribution to malaria case management in pregnancy. After that, partners will discuss a plan to ensure continuous supply with the PNILP.

Proposed Activities for Year One:

Activity	**Description**	**Cost ($000)**
SP procurement	Procure 2.3 million SP tablets (760,000 treatments) for use beginning in early 2008	50

Iron-Folate procurement	Procure 30 million iron-folate tablets for use in 2007 and 2008	100
Quality improvement of FANC services	Evaluate SBM and PBF quality improvement of FANC services at the central and district levels. Design new pre-service training materials with new FANC package and strengthen district level ANC services to promote IPTp uptake.	440
Build capacity for integrated ANC care	Development of new training materials, job aids, IEC/BCC messages, training of providers in FANC, training of CHWs focused on maternal health, and district capacity building in providing supervision for integrated ANC services, salary support for MIP advisor at PNILP (who also sits at the MNCH task force)	130
Total		**720**

Interventions: Epidemic Surveillance and Response

Current Status:

The PNILP national malaria control strategy and plan provides for the prevention and control of malaria epidemics including management and coordination in high-risk districts. The WHO/Uganda office assisted the PNILP to develop the Epidemic Surveillance and Response (ESR) strategic plan (2005-2010) and technical guidelines for the district level. However, assistance is needed to support implementation of the epidemic preparedness and response plans for district-level implementation. The use of IRS is mentioned in the national strategy for epidemic control but not as part of routine preventive spraying because, according to PNILP, it was cost prohibitive. Notwithstanding, PNILP has used IRS in response to epidemics and supports plans to expand IRS to include routine spraying in selected areas twice a year. A proposed four-year protocol for prevention of malaria epidemics was developed with support from the Prince Leopold Institute of Belgium and describes a district-level IRS plan for epidemic malaria, but has not yet been implemented.

In terms of logistic support and capacity, BTC has purchased 100 spray pumps (3 per district) which are stored at the provincial level (20 per province). They have also purchased 2,500 packs of K-Othrine® (Deltamethrine) at 20g per package. Each package covers 200 m^2 (approximately 1 package per household). These products are supplied through CAMERWA and are to be used for epidemics. However, additional supplies are needed that are not covered in the BTC procurement, including insecticides and personal protective equipment. These logistical issues and challenges in the prediction of epidemics warrant additional assistance from PMI. Obtaining IRS equipment, stockpiling insecticides and drugs, and moving spray teams to affected areas can delay the response. Early detection of outbreaks needs additional support at all levels.

Proposed USG Component:

The PMI will support the PNILP to strengthen epidemic preparedness and response plans for district-level implementation. PMI proposes a thorough gap analysis and needs assessment to better understand how the identified instruments and protocols complement those by other

donors and how they address and support the PNILP's plan for strengthening the districts' capacity. The needs assessment will also examine cross-border issues which may affect PNILP's ability to respond and contain epidemics. Additional support is included to implement the PNILP epidemic surveillance and response strategic plan and obtain equipment and stockpiling of insecticides and drugs to ensure timely response in the event of an epidemic.

Proposed Activities for Year One:

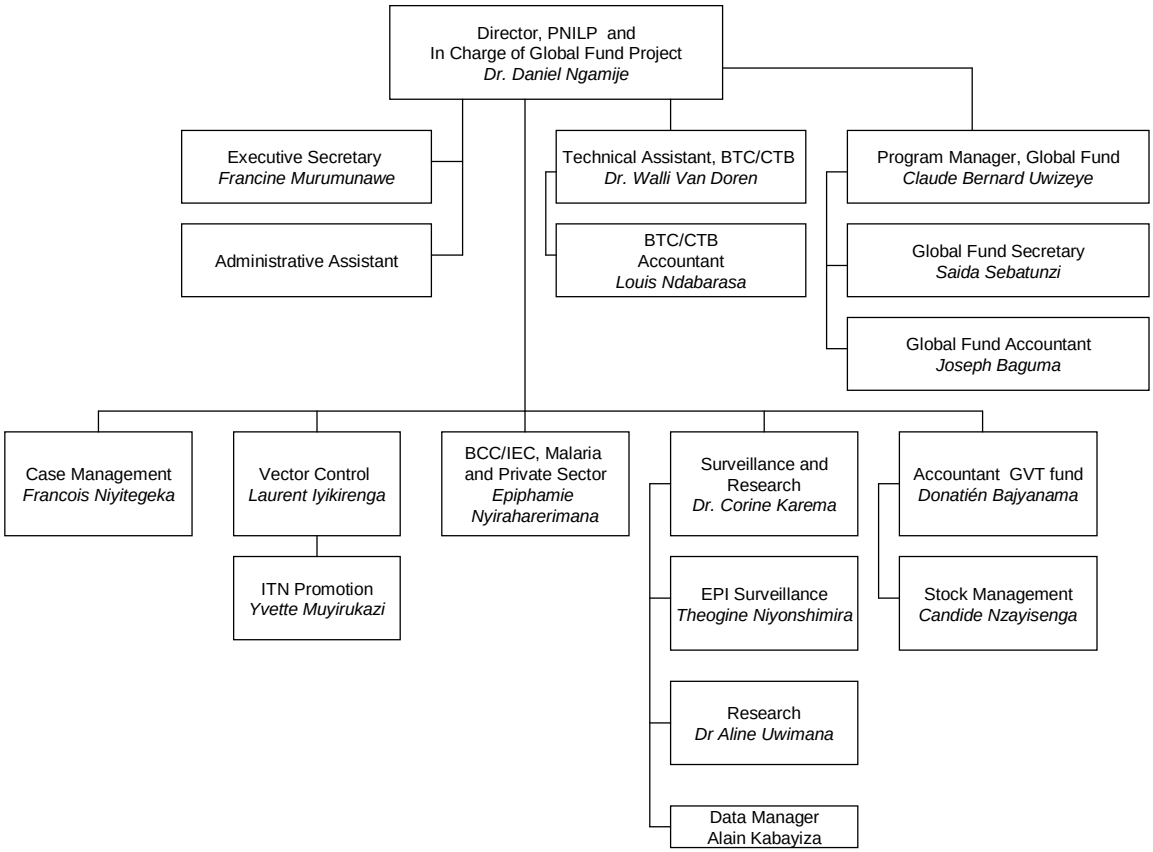
Description	**Activity**	**Cost ($000)**
Epidemic surveillance and response needs assessment	Needs assessment and gap analysis for strengthening district-level capacity	50
PNILP Epidemic Surveillance and Response Plan	Support implementation of the PNILP epidemic surveillance and response plan and ability to respond to epidemics	100
Total		**150**

Capacity Building within National Malaria Control Program

The PNILP functions with a staff of 14 at the central level. The Government of Rwanda (GOR) finances six positions while the GFATM and BTC each provide four; at present USAID/Rwanda funds one position, the MIP advisor. The most glaring gap in technical staff at PNILP is in the area of entomology; three formally trained entomologists are in the GOR, currently at the Ministry of Agriculture and the Rwanda Tourism Bureau. PNILP has the part-time services of a lecturer from the National University of Rwanda who is pursuing a PhD in entomology through a program in Belgium. Efforts to build capacity within the PNILP in the area of IRS are detailed in the IRS section in this report.

The PNILP also lacks robust in-house monitoring and evaluation capacity, currently relying on *ad hoc* input from the GFATM Project Management Unit and BTC. At present, the PNILP responds to localized malaria outbreaks when health facility case load exceeds normal seasonal variation. The PNILP could intervene more proactively at the earliest stages of an outbreak if the NMS were to track data including temperature, rainfall, and apparent humidity, and provide notification to PNILP when environmental conditions become optimal for vector proliferation.

ORGANOGRAM OFTHE NATIONAL MALARIA CONTROL PROGRAM (PNILP)



Proposed USG Component:

In order to consolidate and maintain inroads made in malaria control during the life of PMI, PNILP will require entomological capacity building to commence in the first year of activities. PMI will support graduate-level entomology training of professionals who will assume entomological responsibilities for the PNILP in the medium- and long-term. Staff for training will be identified by PNILP and benefit from direct participation in the scale-up of vector control interventions. PMI will also support an M&E specialist at PNILP as well as provide administrative and accounting support so the national program is able to respond to the expansion in reporting and management requirements that will accompany PMI implementation. These staff positions will require basic office furniture and supplies, networked computer equipment, and phones/fax.

Proposed Activities for Year One:

Entomology training for PNILP staff is budgeted in the IRS Section, support for PNILP supervision and follow-up is addressed in the Case Management Section, and support for an M&E specialist is addressed in the Monitoring and Evaluation Section.

Communications and Coordination

The PNILP's national strategic plan includes the need for a national multi-sector committee for the prevention and control of malaria. The PNILP proposes the establishment of a steering committee to meet twice annually which would include representatives from the Ministry of Health, PNILP, TRAC+, REMA, MINAGRI, MNECOFIN, and the USAID/CDC PMI country team.

The following communication and coordination mechanisms already exist in Rwanda:

Country Coordinating Mechanism

The country coordinating mechanism meets regularly with health sector stakeholders to make decisions based on recommendations that come from four technical advisory panels: (1) Malaria, (2) HIV/AIDS, (3) Health Systems Strengthening, and (4) Human Resource Development. USAID/Rwanda chairs the HIV/AIDS Panel and is vice-chair of the Malaria Panel. USAID is a voting member of the country coordinating mechanism and CDC is a participant. The PNILP's national strategic plan supports greater coordination with the HIV/AIDS community and local commissions particularly at the health district level with the integration of health services.

Malaria Partners/RBM

Chaired by PNILP, the Malaria Partner/RBM group meets semi-regularly with membership limited to development partners directly overseeing implementation of malaria prevention and treatment activities.

Maternal Child Health Task Force

The development of an MCH Task Force is fairly recent and represents an important coordinating body for the PNILP to work with on a comprehensive package of integrated ANC and MCH services. USAID's Capacity Project provides support for a Senior Technical Advisor to this task force.

Private Sector Partnerships

Novartis has been working with PNILP and other partners in malaria control efforts in Rwanda. The PMI anticipates collaboration with Novartis, especially in the area of ACT provision through the private sector. Discussions between PSI, in partnership with PNILP, and Novartis are already well underway, and Novartis has agreed to allow private sector outlets throughout Rwanda to provide Coartem at subsidized prices to increase access for low-income populations to effective anti-malarial treatment.

The PMI will also explore further private sector partnerships, particularly in the area of agriculture.

Monitoring and Evaluation

Current Status:

Health Management Information Service

The national Health Management Information Service (HMIS) collects routine data from the health district, health center, and community levels. An assessment of the HMIS was completed in May 2006 by RTI International to identify weaknesses and recommendations for immediate upgrading of the quality and efficiency of data collection, as well as to suggest longer-term system strengthening improvements, some of which will require substantive infrastructure investment. The assessment was conducted during the period of territorial reform and redistricting and found critical staffing shortages (especially at the central level), the need for the coordination of changes related to the ongoing decentralization, and technical and information limits in the existing systems.

Staff at facilities visited by the HMIS Assessment Team reported continued collection of data per prior instructions. In many instances, data are aggregated and prepared per standard procedure, but facility staff and management have yet to receive clear instruction on where, how, and when to submit reports within the new administrative structures. The HMIS relies on ACCESS '97 software which does not reflect the new administrative structures. The redeployment of public sector employees from the central level to districts under the decentralization policy has reduced the MOH's national staff by roughly two-thirds. The "Mapping Technical Working Group" under the Health Sector Cluster Group has been tasked with developing a plan to implement recommendations of the assessment.

Health centers submit monthly service and case load data to district facilities for input into the national HMIS. Information relevant to the case management of malaria include narrative remarks on patient consultations categorized by disease, numbers of new cases, hospitalizations categorized by disease/age, hospital deaths, number of laboratory tests and results, and information on transfusions. Pharmacy management information is also collected on medicines in stock, medicines consumed, number of stock out days, laboratory products, and cold chain maintenance.

Population-based Surveys

The 2005 DHS was conducted during the months of February and July (which included the rainy season) and the final report has been made available. With implementation of the national decentralization policy and territorial reform, district sizes were increased to reduce the overall number. Sample sizes for the 2005 DHS were based on a smaller population base per district; with new geographic configurations it is not possible to extrapolate results with sufficient power to match the new district lines. Data sets have been re-cut to show district level data according to the old districts and the five new provinces.

Facility Surveys

The last national level Service Provision Assessment (SPA) was conducted in 2001, prior to the launch of PEPFAR, GFATM, and the World Bank Multi-Country HIV/AIDS Program. The health facility landscape has been significantly altered during the intervening years. With PEPFAR and USAID/Rwanda health sector funds, an updated SPA is scheduled to be carried out during 2007. Twubakane conducted a 12-district facility survey in 2005.

Demographic Surveillance Sites

Ten sentinel sites covering approximately 15,000 persons in each catchment area are supported by the PNILP, BTC, and WHO-Rwanda. These sites collect data on cause-specific mortality. The 10 existing sites and 9 planned sites are located in the districts noted in the table below.

PNILP Sentinel Sites, By Province and District

Province	**District**	**Sentinel Sites**	
		Current	**Expansion** (2008)
East	Kirehe	Bukora	
	Kayonza	Rukara	
West	Karongi	Mubuga	Munzanga
	Rusizi	Mashesha	
	Nyabihu	Kivumu	
	Nyamasheke		Gatare
	Rutsiro		Congo Nile
North	Musanze	Rwaza	Nyakinama
	Gicumbi	Bungwe	
	Ngorero		Ramba
	Gakenke		Mataba
	Rulindo		Kinihira
South	Nyanza	Busoro	
	Muhanga		Nyabikenke
	Nyamagabe	Mbuga	
	Nyaruguru		Kibeho
Kigali (Metro)	Kicukiro	Kicukiro	

Proposed USG Component:

The PMI has adopted a general monitoring and evaluating framework that has been adapted to the context of each country. According to this framework, specific activities are monitored on a regular basis to allow in-country program managers to assess progress and redirect resources as needed. Activities within four main intervention areas, ITNs, IRS, IPTp, and case management with ACTs, will be tracked through periodic reports from groups providing commodities, health

facilities, and international and local partners. Types of activities that will be monitored will include procurement and distribution of commodities, availability of commodities for prevention, diagnosis and treatment of malaria, health worker performance, IEC efforts, supervision and training for health care workers, and monitoring drug and insecticide efficacy and effectiveness.

The evaluation framework is based on the PMI goal to reduce malaria deaths by 50% and to achieve coverage targets with specific interventions over the course of the program. The framework is aligned with the standard methodology for malaria program evaluation that is being adopted and promoted by WHO Roll Back Malaria. Program evaluation will be based on coverage outcomes that will be measured at baseline, midpoint, and the end of the Initiative, and impact on malaria mortality, which will be measured at baseline and the end of the Initiative. Information used to evaluate program outcomes and impact in PMI will be collected primarily through household surveys of a representative sample of the national population. All-cause mortality and malaria-specific mortality in children under five (collected through verbal autopsies) will be interpreted together with data on anemia, parasitemia, available information on malaria cases and deaths reported from health facilities, rainfall, and PMI coverage indicators to consider changes in mortality at the population level that can be attributed to reductions in malaria over the course of PMI.

In Rwanda, the main obstacle for adequate monitoring and evaluation of PMI activities will be the collection and integration of data reports from the districts, partners, and other areas within the MOH (such as the National Reference Laboratory). As mentioned previously, human resources capacity at the central level has drastically diminished as a result of decentralization and reassignment of government staff. In order to monitor the progress of PMI interventions and potentially evaluate their impact, data from the 10 sentinel sites will be used. PMI will support a PNILP data manager to assist the PNILP M&E team as well as visits to sentinel sites to strengthen the capacity of the PNILP. The sentinel sites (which currently collect symptoms of disease prior to death) will be supported in potentially collecting malaria specific mortality data disaggregated by age (<5 and ≥ 5 years). The use of routine reports from the PNILP, NGO partners, and other public resources will be the main source of data for monitoring purposes.

PMI will support a national health facility survey through the nationwide SPA survey to assess the adherence to national policy for ACT treatments, the quality of malaria specific health services at the facilities, the quality of ANC services in providing IPT with SP, and the quality/capacity for diagnosing malaria. To guide the expansion of ACTs in HBMF, an evaluation of the five HBMF districts scheduled to use Coartem in Phase 1 will be conducted in mid-2007 before scale up to additional districts. Additional support for community-based systems for M&E will be provided to monitor the expansion of HBMF with Coartem to all 14 districts by the end of 2007. These community-based M&E systems will leverage information generated monthly by the CBDs for assessing patients and determining appropriate treatment action and help specify gaps in community level coverage and performance. PNILP will undertake a post-campaign survey in early 2007 to assess success of the nationwide integrated measles/LLIN distribution campaign conducted in September 2006.

Coordination and logistical support will be needed to ensure that routine meetings of the Malaria Task Force take place. In collaboration with the PNILP, PMI will provide this support to ensure continuation of the Malaria Task Force.

PMI will also support a gradual staging of an information technology network over the next two years for evaluation of IRS coverage (i.e. mapping of houses and their density, quantities of insecticide, etc.) and LLIN coverage (i.e. age structure, condition, planning for replacement, etc) among 10 PNLIP sentinel sites with five-six sites covered in Year 1. The network would include GPS systems and GIS and PDA technology to manage the data. This technology can also assist with large nationwide coverage and mortality surveys as well as epidemic surveillance to reinforce PNILP's epidemic response plans. PMI will explore potential pooling of resources with other programs and partners such as PEPFAR and BTC on this type of technology for data collection and use.

Proposed Activities for Year One:

Activity	**Detail**	**Cost ($000s)**
PNILP data management	Assist PNILP M&E team to ensure timely data collection through support for a PNILP Data Manager, coordination of M&E activities among partners, assistance in quality assurance of data and accessibility of data at the central level; computer, equipment/supplies, travel costs.	75
Evaluation of ACT use in HBMF	Evaluate 5 HBMF districts for quality of services after introduction of Coartem (Phase 1)	50
Support to sentinel sites	Collect malaria specific and all cause mortality data disaggregated by age group and strengthen entomological surveillance to monitor and evaluate IRS activities.	190
National Health Facility Survey	Assess malaria case management, IPTp use, health worker performance in sick child clinics, ANCs, inpatient facilities, laboratory assessment.	150
Community-based systems for M&E	Support the Community Based Health Information System using CHWs in monitoring LLIN/ACT usage, track community-level treatment indicators and treatment protocol compliance (potentially an appropriate area for a PBF model); this system will link to the national HMIS	100
Support to national Malaria Taskforce	Coordination and logistical support (e.g. room rental, basic supplies/services) for meetings.	5
Information Technology Network	Initial investment in an information technology network to evaluate LLIN and IRS coverage with GPS systems and GIS and PDA technology	210
Total		**780**

Staffing and Administration

Two new health professionals will be hired to oversee the PMI in Rwanda, one representing CDC and one representing USAID. In addition, one or more FSNs will be hired to support the PMI team. All PMI staff members will be part of a single inter-agency team led by the USAID Mission Director or his/her designee in country. The PMI team will share responsibility for development and implementation of PMI strategies and work plans, coordination with national authorities, managing collaborating agencies and supervising day-to-day activities. Candidates for these positions will be evaluated and/or interviewed jointly by USAID and CDC, and both agencies will be involved in hiring decisions, with the final decision made by the individual agency.

It is envisioned that these two PMI professional staff will work together to oversee all technical and administrative aspects of the PMI in Rwanda, including finalizing details of the project design, implementing malaria prevention and treatment activities, monitoring and evaluation of outcomes and impact, and reporting of results. Both staff members will report to the USAID Mission Director or his/her designee. The CDC staff person will be supervised by CDC both technically and administratively. All technical activities will be undertaken in close coordination with the MOH/PNILP and other national and international partners, including the WHO, UNICEF, the GFATM, World Bank, and the private sector.

Locally-hired staff to support PMI activities either in Ministries or in USAID will be approved by the USAID Mission Director. Because of the need to adhere to specific country policies and USAID accounting regulations, any transfer of PMI funds directly to Ministries or host governments will need to be approved by the USAID Mission Director and Controller.

Annex 1

Table 1: Rwanda Year 1 (FY06) Timeline of Activities

ACTIVITY	2006	2007											
	OCT-DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Hire PMI in-country staff													
Private Sector Provision of ACTs													
Private Sector Provision of ACTs													
PSI/PNILP PSP Retailer Survey													
Prevention and control of malaria during pregnancy													
Initiate purchase SP for IPTp													
Purchase iron/folate													
Strengthening integrated ANC services													
Home-Based Management of Fever													
Develop/adapt training and IEC materials and conduct training													
Procure Coartemfor phases 1 and 2													
Training, Start Coartem treatment													
Supervision, M&E													

Training, start Coartem treatment in phase 2 HBMF districts													
Supervision, M&E in phase 2 districts													
Facility-Based Case Management													
Purchase injectable artemether													
Vector Control													
IEE/PERSUAP for IRS activities													
Baseline data collection for IRS													
IRS commodities procurement													
IEC/BCC, IRS prep													
Round 1 of IRS (in 3 districts)													
LLIN procurement and distribution													
Training													
M&E													
IT network													

Table 2: Rwanda Planned Obligations for FY07 ($000)

Proposed Activity	Mechanism	Budget (*comm-odities)*	Geographic Area	Description of Activity	Relation to Interventions
PREVENTION					
IRS in 5 districts	RTI IRS IQC	4,358 *(1,939)*	5 Districts with 2 spraying rounds	Procurement of IRS equipment (insecticide, sprayers, etc.) implementation, data collection, protocols/guidelines, IEC/BCC, logistics support for July/August 2007 spraying	IRS
Entomology Training	Tulane Bilateral	150	PNILP/Kigali	Post graduate training in entomology, mid-level management	IRS
Purchase LLINs	PSI Bilateral	3,150 *(3,150)*	Nationwide	LLINs targeting children under 5, ANC, poorest of the poor, as well as one district formative evaluation of optimal IRS/ITN use.	LLINs
Strengthen LLIN transport systems	RPM+	150	Nationwide	Improve delivery of LLINs from district to community level	
BCC/IEC related to LLINs	PSI Bilateral	150	Nationwide	Develop capacity to improve low coverage levels	LLINs
SUBTOTAL: Preventive		**7,958** ***(5,089)***			
CASE MANAGEMENT					
Procurement of injectable artemether	RPM+	125 *(125)*	Nationwide	Procurement of injectable artemether treatment of severe malaria cases at health facilities	Facility Based Case Mngmt.
ACT treatment compliance	RPM+	200	Nationwide	Reinforcement of recent ACT transition training with job aids on ACT treatment protocols, counseling cards and language appropriate brochures for clients	Facility Based Case Mngmt.
Phased HBMF	Twubakane (1,562k), Concern with subs to World Relief & IRC (609k)	2,171	14 districts	Phase I, introduce HBMF w/ Coartem in 5 districts, Phase II, change 1st line drug in HBMF from AQ/SP to Coartem, Phase II procurement for 2008, BCC/IEC, supervision	Home Based Case Mngmt.
Procurement of ACTs for HBMF	WHO	1,620 *(1,620)*	14 districts	Procurement of Coartem for implementation of HBMF in 14 districts through NGOs.	Home Based Case Mngmt.
Performance-Based Financing for case referral	MSH	25	5 districts (overlap w/ HBMF districts)	Reinforcement of referral and emergency transport process from community to health facility using PBF model	Home Based Case Mngmt.
Private sector ACT implementation	TBD	1,140	Nationwide	Support PNILP with roll out of ACTs through distribution of pre-packaged branded Coartem through private channels, BCC/IEC, treatment and referral training, M&E	Pvt. Sector Provision of ACTs
Private Sector Mapping	PSI Bilateral	100	Nationwide	Conduct a mapping assessment of the private sector outlets	Case

Assessment and ACT Repackaging				and vendors and produce repackaged ACT treatments with PNILP for private sector and HBMF use.	Management
Procurement of ACTs	TBD	258 *(258)*	Nationwide	Procure Coartem for private sector delivery.	Case Management
Strengthening of commodity distribution system	RPM+, Concern with subs to World Relief & IRC	488	Nationwide	Improve commodity distribution system through training in warehouse management, QA in warehouses, and staff placement in warehouses, and support to district health centers.	Drug supply/ Management
Drug efficacy and pharmacovigilance	RPM+	55	Nationwide	Assess pharmacovigilance system development, workshop/ training for data monitoring and supervision, support one staff in each district	Drug supply/ Management
Malaria laboratory diagnostics	CDC	*244* *(4)*	Nationwide	QA/QC protocol and program development for malaria diagnosis, laboratory support including staff at the central level, transportation/fuel for supervisory visits, equipment/ supplies (Earl lights).	Malaria Diagnostics
National Reference Laboratory Supplies	Twubakane	16 *(16)*	MOH/Kigali	Urgent laboratory equipment and supplies, slides, and reagents	Malaria Diagnostics
PNILP Supervision	Twubakane	150	PNILP/Kigali	Support PNILP supervision and follow-up on prevention and case management activities through leasing of transportation.	Case management
SUBTOTAL: Case Management		**6,592** ***(2,023)***			
PREVENTION OF MALARIA IN PREGNANCY (MIP)					
SP procurement	Twubakane	50 *(50)*	Nationwide	Procure 2.3 million SP tablets for IPTp for use in 2008	MIP
Iron-Folate procurement	Twubakane	100 *(100)*	Nationwide	Procure 30 million iron-folate tablets for use in 2007/08	MIP
Quality improvement of FANC services	JHPIEGO Access	300	Nationwide	Evaluate current quality of ANC services, PBF schemes and SBM in improving quality, design pre-service training with new FANC package.	MIP
Quality improvement of district FANC services	Twubakane	140	12 Districts	Strengthening district level ANC services and community mobilization for IPTp uptake.	MIP
Build capacity for integrated ANC care	WHO	130	Nationwide	Development of integrated FANC training materials, job aids, IEC/BCC messages, refresher training, support for MIP Advisor .	MIP
SUBTOTAL: Prevention of MIP		**720** ***(150)***			
EPIDEMIC SURVEILLANCE AND RESPONSE (ESR)					
ESR Needs Assessment	RTI IRS IQC	50	Epidemic Districts	Needs assessment and gap analysis to strengthen district capacity for epidemic detection and response plans	ESR

Support to PNILP ESR strategic plan	RTI IRS IQC	100 (50)	Epidemic Districts	Support implementation of the PNILP ESR strategic plan, including procurement of additional equipment to respond to epidemics	ESR
SUBTOTAL: Epidemic Surveillance and response		**150** ***(50)***			
MONITORING AND EVALUATION					
PNILP Data Management	CDC	75	N/A	Support for a PNILP Data Manager to assist PNILP M&E team in data collection, coordination of activities among partners, QA of data and accessibility of data at central level; computer, equipment/supplies, travel.	M&E
Evaluation of ACT use in HBMF	BASICS III	50	5 HBMF Districts	Evaluate the 5 HBMF districts for quality of services after introduction of Coartem (Phase I)	M&E
Support to sentinel sites	Tulane (90k) RTI IRS IQC (100k)	190	10 sentinel sites dispersed nationwide	Collect malaria specific and all-cause mortality data disaggregated by age group/pregnancy status, including verbal autopsy. Strengthen 10 sites in entomology and surveillance for IRS.	M&E
National Health Facility Survey	ORC/MACRO (100k) JHPIEGO Access (50k)	150	Nationwide	Assess malaria case management, IPTp use, and health worker performance in sick child clinics, ANCs, in-patient facilities, lab assessments (part of nationwide SPA survey)	M&E
Community-Based Systems for M&E	Twubakane with sub to Tulane, Concern with subs to World Relief & IRC	100	Districts aligned with HBMF expansion	Community-based systems with community health agents to monitor ITN/ACT use, tracking comm. level indicators and treatment adherence	M&E
Support to Malaria Taskforce	Twubakane	5	Kigali	Coordination and logistical support (e.g. room rental, basic supplies/services) for meetings.	M&E
Develop Information Technology Network	Tulane (180k) CDC (30k)	210	Nationwide	10 PNILP sentinel sites with an information technology network including GPS/GIS/PDAs for real time evaluation of LLINS and IRS coverage. IT network support for PNILP.	LLINs/IRS
SUBTOTAL: M&E		**780**			
IN-COUNTRY MANAGEMENT AND ADMINISTRATION					
In-country staff and administrative expenses	CDC/USAID	800	Nationwide	Salaries, benefits of in-country PMI staff, support staff, office equipment, supplies, and vehicle.	Mngt. & Admin.
SUBTOTAL: Management and Administration		**800**			
GRAND TOTAL		**17,000** ***(7,312)***	***Commodities represent 43% of total budget (7,312)***		

Table 3: Rwanda Year 1 Targets Assumptions and Estimated Year 1 Coverage Levels

Year 1 PMI Expected Results:

1. At least 500,000 LLINs will have been distributed by partners to families with children under five and/or pregnant women to support achievement of nationwide household ownership of ITNs of >50%.
2. At least 85% of houses (approximately 145,000 households) in geographic areas targeted for IRS during Year 1 will have been sprayed.
3. Intermittent preventive treatment with SP in pregnant women (IPTp) will have been implemented nationwide in all 30 districts reaching approximately 195,000 pregnant women (50% of target population) with 2 or more doses of IPTp.
4. Sixty thousand treatments of injectable artemether will have been made available to cover the annual projected cases of severe malaria requiring referral to a higher level of care.
5. Malaria treatment with ACTs will have been implemented at the community-level through home-based management of fever in 5 districts.
6. Malaria treatment with ACTs will have been initiated in the private sector by reaching approximately 100 accredited pharmacies and drug outlets.

Assumptions:

Population of country (estimated): 9,100,000

Pregnant women:	4.3% of total population = 390,000 pregnant women
Infants (children <1):	3% of population = 273,000 infants
Children <5:	17% of population = 1,550,000 children under five
PLWHAs:	188,000 people

Average number of malaria-like episodes per year and cost per treatment:

Children <5:	3.5 episodes/year at $0.90 each
Older children (5-19):	2.0 episodes/year at $2.40 each (assume that the PMI will cover only one-third of older children episodes)
Adults (20-80+):	0.5 episodes/year at $2.40 each (assume that the PMI will cover only one-third of adult episodes)

Average of 2.5 nets per household needed to cover all pregnant women and children under five in family.

Average number of persons per household = 5

Inter-vention	Needs for 100% Nationwide Coverage over 3 Years*	Needs for 85% Nationwide Coverage over 3 Years*	Annual Needs to Achieve 100% Coverage	Needs to Achieve Year 1 PMI Targets	Year 1 Contributions
IPTp	390,000 pregnant women x 2 treatments/woman = ~0.77 million treatments/year x 3 years = 2.3 million treatments (=13..8 million SP tablets)	11.7 million SP treatments	0.77 million SP treatments	**Target:** 65 *% of pregnant women receive 2 doses of IPTp = 500,500 doses*	Purchase of 0.77 million IPTp treatment doses for use in year 2 (2008) **Thus 100% of SP needs are met in Year 1**
LLINs	1.82 million households x 2.5 nets/household = 4.55 million nets	4.1 million LLINs needed for >90% coverage or 3.86 million for 85% coverage	One-third of 4.55 = 1.5 million LLINs One-third of 90% of 4.55 = 1.36 million LLINs	**Target**: 50% *of households owning an LLIN* = 680,000 LLINs	4.55 million LLINs needed and 3.3 million LLINs available (from GFATM) with an estimated gap of 785,000 LLINs remaining to be filled over the next 3 years (261,000 LLINs per year). PMI will contribute 450,000 LLINs in Year 1 (cost factor is $7.0 per net= $3.15 million). **Thus 100% of LLINs needs are covered in the first year.**
ACTs – children < 5	1,547,000 million children under 5 x 3.5episodes/year = 5,414,500 million treatments/year x 3 years = 16,243,500 million	16,243,500 million x 85% = 13,806,975	5,414,500 million treatments	Target: 30% of children under 5 receive ACTs = 1,624,350 treatments for 30%	It is anticipated that GFATM will contribute 3 million ACT treatments in Year 1 (9 million over 3 years). PMI will contribute 1,800,000 treatments with HBMF to children under five and 200,000 treatments for children under five through the private sector. **Thus 100% of ACT needs for children under five are covered in the first year.**
ACTs – older children (5-19)	3,640,000 million persons x 2.0 episodes/year x 33% of treatments covered = 2,402,400 million treatments/year x 3 years = 7,207,200 million	7,207,200 million x 85% = 6,126,120	2,402,400 million treatments		
ACTs – adults (20-80+)	3,913,000 million persons x 0.5 episodes/year x 33% of treatments covered =	1,936,935 million x 85% = 1,646,395	645,645 million treatments		

ACT TOTAL	645,645 million treatments/year x 3 years = 1,936,935 25,387,635 million treatments	21,579,490 million treatments	8,462,545 million treatments		
IRS			171,000 households	**Target**: *85% of targeted houses to be sprayed=* 145,000 households to be sprayed	PMI will support IRS activities in 3 districts or 171,000 households in the first year. **Thus 100% of IRS needs will be covered in Year 1.**

*These calculations are based on the assumption that the total population of 9.1 million is at risk of malaria.

Table 4: Year 1 (FY07) Budget Breakdown by Intervention ($000)

Area	Commodities (%)	Other (%)	Total
Insecticide-treated Nets	$3,150,000 (91%)	$300,000 (9%)	$3,450,000 (100%)
Indoor Residual Spraying	$1,939,000 (43%)	$2,569,000 (57%)	$4,508,000 ($100)
Case Management	$2,023,000 (31%)	$4,569,000 (69%)	$6,592,000 (100%)
Intermittent Preventive Treatment	$150,000 (21%)	$570,000 (79%)	$720,000 (100%)
Epidemic Preparedness & Response	$50,000 (33%)	$100,000 (67%)	$150,000 (100%)
Monitoring and Evaluation	$0 (0%)	$820,000 (100%)	$820,000 (100%)
Administration	$0 (0%)	$800,000 (100%)	$800,000 (100%)
Total	$7,312,000 (43%)	$9,688,000 (57%)	$17,000,000 (100%)

Table 5: Year 1 (FY07) Budget Breakdown by Partner ($000)

(Once the FY07Implementation Plan is approved and contracts/grants cooperative agreements awarded, all other partners will be listed here)

Partner Organization	Geographic Area	Activity	Budget ($000)
BASICS	HBMF implementation districts	Evaluation of HBMF phases	50
Centers for Disease Control	Nationwide	Malaria laboratory diagnostics strengthening, IT Network capacity building, CDC staffing	768
Concern with subs to World Relief International Rescue Committee	HBMF implementation districts (5-12 districts)	Home-based Management of Fever implementation with ACTs, strengthen community M&E & logistics for ITNs	609
Intrahealth's Twubakane Project	HBMF implementation districts (5-12 districts)	Home-based Management of Fever implementation with ACTs, development of a community-based M&E system, strengthen integrated ANC and MIP services, support for PNILP supervision	2,123
JHPIEGO ACCESS Project		Review ANC SPA module, strengthening Malaria in Pregnancy and IPTp, and supporting integration of focused antenatal care services	350
Management Systems for Health	5 HBMF districts	Performance-based Financing for case referral	25
ORC/Macro	Nationwide	National health facility survey with malaria	100

		component	
Population Services International	Nationwide	Mapping assessment of the private sector, ACT treatment repackaging, procurement and distribution of 450,000 LLINs	3,400
Rationale Pharmaceutical Management Plus Project	Nationwide	Strengthening of commodity distribution systems, transportation and drug management and pharmacovigilance, procurement of injectable artemether, ACT treatment compliance	1,018
Research Triangle Institute	5 Districts – IRS Nationwide – epidemic response 10 Sentinel Sites	Indoor residual spraying, support for epidemic preparedness and response, and strengthen sentinel site capacity for entomological surveillance	4,608
Tulane	Nationwide	Build capacity of 10 sentinel sites for malaria specific data, entomology training, IT Network development	420
TBD	Nationwide	Procurement of ACTs for the private sector	258
TBD	Nationwide	Private Sector ACT implementation	1,140
WHO	14 HBMF Districts, Nationwide MIP activities	Procurement of ACTs for HBMF, strengthen MIP and uptake of IPTp services	$1,750

Annex 2

Three Year Strategy and Plan: Rwanda

GOAL AND TARGETS OF THE PRESIDENT'S MALARIA INITIATIVE (*by 2010*)

The goal of the PMI is to reduce malaria-associated mortality by 50% compared to pre-Initiative levels. By the end of 2010, PMI will assist Rwanda to achieve the following targets in populations at risk for malaria:

- >90% of households with a pregnant woman and/or children under five will own at least one ITN;
- 85% of children under five will have slept under an ITN the previous night;
- 85% of pregnant women will have slept under an ITN the previous night;
- 85% of houses in geographic areas targeted for IRS will have been sprayed;
- 85% of pregnant women and children under five will have slept under an ITN the previous night or in a house that has been sprayed with IRS in the last 6 months;
- 85% of women who have completed a pregnancy in the last two years will have received two or more doses of IPTp during that pregnancy;
- 85% of government health facilities have ACTs available for treatment of uncomplicated malaria; and
- 85% of children under five with suspected malaria will have received treatment with an antimalarial drug in accordance with national malaria treatment policies within 24 hours of onset of their symptoms.

PREVENTION

Indoor residual spraying (IRS)

Over the next three years, the focus for IRS activities will be on strengthening district-level capacity to implement routine spraying campaigns and gradually scaling up the approach. By year two, PMI will support routine spraying in five districts twice yearly, covering a population of approximately 1.26 million. Additional recommendations made through the initial environmental assessment in year one will assist with formulating a strategy for IRS activities in the future. The cost and frequency of IRS activities will determine the capacity and scale for expanded IRS activities over the next three years. PMI will work with PNILP and coordinate with other in-country malaria partners including BTC and the GFATM to plan and potential co-fund the next phasing of IRS activities to achieve broader national coverage. Districts targeted for IRS activities will continue to be chosen based on levels of malaria endemicity, LLIN coverage, etc.

Insecticide-treated nets

The 3.3 million LLINs available from the GFATM plus the 450,000 LLINs contribution proposed for year one are sufficient to provide greater than 90% coverage for the PMI target

groups. Thus, the activities covered over three years will emphasize improving compliance with routine (nightly) use of LLINs, verification and increasing coverage levels in target groups, monitoring existing LLINs for loss of insecticidal efficacy, procurement and planning for replacement of LLINs, and quality control of LLINs.

The PMI will support the following activities to meet these goals. Comprehensive IEC programs at the national, district and village levels; an LLIN M&E activity capable of monitoring the condition and use of LLINs such as the planned phasing-in of PDAs and GIS mapping technology systems in Years 1 and 2; a procurement and distribution mechanism for issuing new and replacement LLINs; public health evaluation of intervention, including examining the dual strategy of IRS and ITNs in one district (i.e. one-two punch approach); and identification of permanent mechanisms to sustain LLIN coverage.

CASE MANAGEMENT

The Three Year Strategy and Plan for PMI has been developed to support the PNILP's five year plan to achieve a reduction of malaria-related mortality by 50% by the end of 2010. Specific objectives for the PNILP at the health facility level include increasing the proportion of cases of uncomplicated malaria treated according to national policy to 90%, increasing the proportion of cases of severe malaria treated according to national policy to 90%, and maintaining the proportion of healthcare providers trained in malaria treatment at >90%. PMI will also support the PNILP in reaching the specific objective of increasing the proportion of cases of children less than five years who receive appropriate treatment for malaria within 24 hours.

In order to support the use of ACTs nationally, PMI will coordinate with other donors (such as GFATM) to purchase and supply ACTs to all health facilities, to communities with HBMF, and to the private sector for children U5. During the first year, PMI plans to purchase injectable artemether for health facilities (other ACTs have been purchased with GFATM funds), as well as Coartem for use in HBMF in 12 districts, and subsidized pediatric Coartem for the private sector. For the second year of the initiative, PMI anticipates increasing the level of support to procure ACTs and injectable artemether for the health facilities, increasing the supply of ACTs to HBMF, and potentially supplying Coartem for private sector distribution. Finally, the third year of PMI will include support for the procurement of Coartem for health facilities, HBMF districts, and additional private sector outlets. Training on the appropriate use of ACTs, reinforcing supervision, and monitoring and evaluation of adherence with the new treatment regimen will be supported and scaled up as needed in order to complement the expansion of ACTs into additional districts.

The three-year plan for reinforcing the laboratory diagnostic capacity for malaria will be coordinated with PEPFAR laboratory activities for an integrated, synergistic approach. Training to improve the skills of the current technicians and to increase supervisory support will be emphasized in the first year. Because there is little experience with the introduction of RDTs into the national laboratory system, the second-year plan will possibly include an evaluation of RDTs in order to determine whether their use will be advantageous to malaria treatment and in which particular settings. PMI support for the subsequent years will focus on the reinforcement

of the supervisory and quality assurance/quality control system, refresher training, and possibly the use of RDTs in HBMF.

The final component of PMI support for case management includes the reinforcement of the process for referring patients identified in the community to health facilities. The first-year plan includes using a performance-based funding model to promote successful, appropriate referrals. The development of a system for emergency transportation could be a component of the plan.

PREVENTION AND CASE MANAGEMENT OF MALARIA DURING PREGNANCY

PMI will support the prevention of malaria during pregnancy through interventions known to reduce the burden of MIP, especially ITNs and IPTp. At present, uptake of IPTp is limited by the fact that women come late for their first ANC visit, and generally do not make the recommended number of visits (four, three of which are after quickening). In order to increase uptake, concerted efforts must be made to provide an integrated package of high quality services and increase awareness and perceived importance of the value and availability of those services among women. It is widely agreed in Rwanda that early and sustained utilization of ANC services (including MIP interventions) throughout pregnancy will come only with the provision of integrated ANC services that include nutritional services (including provision of iron/folate for anemia prevention), immunizations (tetanus), de-worming, prevention of mother to child transmission of HIV (PMTCT), and services related to health pregnancy and safe birth.

Currently, there is support for the purchase of SP for IPTp and ITNs for targeted and subsidized distribution to pregnant women from GFATM. The support for IPTp is sufficient through the end of 2007 (estimated). There are no funds available for IPTp support beyond 2007 identified at this time. Support for the purchase of iron folate is currently limited to small focal donations. With the termination of the USAID-funded Malaria Action Coalition, there is no further support available for issues of implementing MIP interventions as part of an ANC package.

Year 1 activities will be focused on an evaluation of the quality of current ANC services, and a push towards designing an integrated package of services that would include MIP and PMTCT in focused ANC. Additional year one activities would include a refresher training for ANC providers, a newly designed training for community MCH workers (agents de sante maternelle), and a determination of how best to ensure quality of services and build capacity at the district level for integrated supervision of ANC services.

In future years, the emphasis will be on supervision (district-level), quality of services, community education, additional refresher trainings as required (currently envisioned for year 3), and M&E. If the study on IPTp with SP currently underway under the supervision of PNILP and BTC were to show that IPTp with SP is not efficacious in preventing MIP and its adverse consequences in Rwanda, there will be an urgent need to adjust this strategy. The results of this study can be expected some time in late 2007. At present, there are no other drugs with sufficient safety and efficacy data to recommend their use as IPTp, but that is expected to change during the life of PMI.

The MCH Task Force will need to be the locus for most of these activities, with strong support form the PNILP for the MIP component. There is a pressing need to align support of both PEPFAR and PMI to strengthen ANC services. Other key partners in the scale-up of MIP interventions will be the WHO office in Rwanda, and the Regional JHPIEGO office in Nairobi.

SP and iron/folate for the MIP component will be procured through a central mechanism that has not yet been determined, and distributed in country by CAMERWA.

The key to M&E of the MIP component will be a redesign of a single integrated ANC register that records provision of IPTp and ITNs. These data will then need to be incorporated into the routine flow of data through the health information system. While these data will underestimate community level coverage, they will provide the needed data for month-to-month identification of problems at the health facility level. True coverage data will be obtained through periodic household surveys as for other interventions. There will also be a community-based M&E component that will help to provide essential coverage at the community level.

EPIDEMIC SURVEILLANCE AND RESPONSE

The focus of PMI support for PNILP's epidemic surveillance and response will concentrate on district-level capacity-building and implementation over the next three years. PMI will need to monitor the situation carefully and ensure that the PNILP will be able to respond appropriately. Managing and strengthening information and surveillance systems will be an important component to monitoring epidemics and ensuring timely responses. PMI will also consult with other in-country malaria partners, including BTC and the Africa Development Bank on a long-term strategy for epidemic surveillance and response. Cross-border issues may warrant further attention across specific intervention areas particularly for monitoring and surveillance.

MONITORING AND EVALUATION PLAN

In support of the PNILP's five-year national strategy, PMI will reinforce human resource capacity in order to strengthen the quality and timeliness of data collection from the districts, sentinel sites, partners, and other relevant sources. In order to accomplish this, support for hiring a data manager and providing M&E technical assistance to the PNILP will be essential component throughout all years of the PMI plan.

The use of currently collected, routine data from existing systems such as the HMIS and the sentinel surveillance sites will be used for ongoing program monitoring and will continue through the subsequent years of PMI. The National Health Facility Survey assessing quality of services will be conducted in 2007 and will provide health facility based information on issues related laboratory diagnosis, quality of malaria services, pharmacy performance, and ANC services. The population based surveys that will provide information on impact of PMI will include the Malaria Indicator Survey planned for 2008, and the next Demographic Health Survey in 2010. Finally, discrete surveys or targeted evaluations related to activities in development (such as the use of RDTs, or an assessment of private sector use of ACTs) will be supported as needed.

SUSTAINABILITY PLAN

The key to sustainability of PMI activities in Rwanda rests on several pillars:

- Increasing and maintaining demand for quality services for the prevention and treatment of malaria. If the population perceives that there is benefit from the malaria services being offered at the community and health facility level (as well as from the private sector), then demand for those services will put pressure on all levels of the government to ensure that those services are maintained.

- District level strengthening. In the decentralizing environment of Rwanda, building capacity at the district level will allow for a long term decrease in the running costs of many programs. This is particularly true in the case of IRS, and in supervision of health care workers at both the community and facility levels. The less supervision that needs to take place from the central level, and the more capable districts are in taking over this role, the more likely such activities will continue beyond the lifespan of PMI.

- Increasing quality of services. There is currently a strong push within the GOR to move forward with PBF. While the role of PBF in assuring the quality of services in Rwanda is not yet completely settled, it is clear that a system that rewards health facilities for the delivery of services as designed (both in terms of quantity and quality) will be an important factor for ensuring sustainability in the Rwandan context.

- Capacity building. In some areas, particularly entomology, there is simply not a sufficient number of adequately trained personnel at either the central or district level to ensure the sustainability of interventions such as IRS. It will therefore be essential to train senior level entomologists (PhD), as well as mid level entomologists (MPH level), and lower level spray managers (district level) to ensure ability to continue activities such as IRS after PMI.

Table 1: Proposed 3-Year Timeline of Coverage of Interventions: Rwanda

Coverage Target	DHS 2005	*Year 1**	Year 2	*Year 3**	Year 4
Proportion of households with a pregnant woman and/or children under five will own at least 1 ITN	14.7%** +	*50%*	65%	*80%*	>90%
Proportion of pregnant women sleeping under an ITNs the previous night	17.2%	*45%*	60%	*70%*	85%
Proportion of children under five sleeping under an ITNs the previous night	13.0%	*45%*	60%	*70%*	85%
Proportion of children under five with fever in previous 2 weeks treated with appropriate antimalarial drug within 24 hours of onset of symptoms	3.0%	*30%*	40%	*60%*	85%
Proportion of government health facilities have ACTs available for treatment of uncomplicated malaria	0%**	85%	*85%*	85%	85%
Proportion of women who have completed a pregnancy in the last two years will have received two or more doses of IPTp during that pregnancy;	0.3%**	*65%*	75%	*85%*	85%
Proportion of households in geographical areas targeted for IRS that have been sprayed	N/A	*85%*	85%	*85%*	85%
Proportion of pregnant women and children under five will have slept under an ITN the previous night or in a house that has been sprayed with IRS in the last 6 months	N/A	*50%*	60%	*75%*	85%

* Nationwide coverage of interventions will be measured on three occasions: (1) 2007 (baseline data from MICS); (2) end of Year 2; and (3) after September 2010. Year 1 and Year 3 coverage figures are shown in italics to indicate that coverage will be estimated based on delivery of ACTs and IPTp treatments, distribution of ITNs, and households protected by IRS.

** DHS was carried out before approval of the IPTp with SP policy, the integrated measles-ITN campaign, and the roll-out of ACTs to government health facilities; yearly targets for these indicators were set based on available national coverage data at the time of the PMI planning, however, pending the results from the MICS 2007 and other data sources to monitor program progress, the yearly targets may be adjusted to reflect the progress made by PNILP activities before the implementation of PMI.

+ DHS measures all households and hence this PMI indicator is a subset of this reported percentage; in subsequent years, PMI will, however, measure ITN ownership in households with a pregnant woman and/or children U5.

Table 2: Illustrative 3-Year Budget and Expected Coverage Levels

PMI Targets: By the end of 2010, PMI will assist Rwanda to achieve the following targets in populations at risk for malaria:

- >90% of households with a pregnant woman and/or children under five will own at least one ITN;
- 85% of children under five will have slept under an ITN the previous night;
- 85% of pregnant women will have slept under an ITN the previous night;
- 85% of houses in geographic areas targeted for IRS will have been sprayed;
- 85% of pregnant women and children under five will have slept under an ITN the previous night or in a house that has been sprayed with IRS in the last 6 months;
- 85% of women who have completed a pregnancy in the last two years will have received two or more doses of IPTp during that pregnancy;
- 85% of government health facilities have ACTs available for treatment of uncomplicated malaria; and
- 85% of children under five with suspected malaria will have received treatment with an antimalarial drug in accordance with national malaria treatment policies within 24 hours of onset of their symptoms.

Assumptions:

Population of country (estimated): 9,100,000

Pregnant women:	4.3% of total population = 390,000 pregnant women
Infants (children <1):	3% of population = 273,000 infants
Children <5:	17% of population = 1,550,000 children under five
PLWHAs:	188,000 people

Average number of malaria-like episodes per year and cost per treatment:

Children <5:	3.5 episodes/year at $0.45 each[4]
Older children (5-19):	2.0 episodes/year at $1.35 each (assume that the PMI will cover only one-third of older children episodes)
Adults (20-80+):	0.5 episodes/year at $1.35 each (assume that the PMI will cover only one-third of adult episodes)

Average of 2.5 nets per household needed to cover all pregnant women and children under five in family.

[4] Prices are lower in Three-Year Plan due to planned decrease in prices of Coartem.

Average number of persons per household = 5

Assume that 100% of total Rwandan population is at risk of malaria = 9,100,000
Cost of IPTp with SP: $0.20 ($0.10 for each of the two treatments a woman will receive during her pregnancy)

Average household will require 2.5 ITNs to cover all children under five and pregnant women in the family
Cost of a long-lasting ITN = $7.00

Cost multiplier factor: Due to the moderate cost of living and doing business in Rwanda, implementation costs (epidemic preparedness, implementation support, and M&E) will be comparable with estimates for Tanzania and Uganda.

Item/Activity	Annual Cost per Person	Annual Cost	3-Year Total	Assumptions/Comments
Prevention – insecticide-treated nets		$1,832,299	$5,496,897	9.1 m population = 1.8 m householdsx2.5 nets/hh x 90% coverage - 3.3m planned for distribution or distributed x $7/net
Prevention – indoor residual spraying		$11,475,000	$34,425,000	Targeting one-half the total population = 900,000 households x $15/hh x 85% coverage (approximate doubling of scale yearly)
Treatment – malarial illnesses		$12,470,456	$37,411,368	9.1 m pop at risk, 17% children under 5 with 3 febrile illnesses per year at $0.45/treatment. Remaining population with an average of 1.25 illnesses/year at $1.35/treatment. 85% coverage.
Prevention – SP for IPTp		$66,300	$198,900	390,000 pregnant women per year x $0.20/year x 85% coverage
Epidemic Preparedness	$0.08	$720,000	$2,160,000	Based on detailed calculations from Uganda plan
Implementation Support	$0.92	$8,280,000	$24,840,000	Commodity management, human resources, supervision, training, social mobilization, etc.
Monitoring and Evaluation		$2,000,000	$6,000,000	
Cost of Program			**$110,532,165**	
USG Implementation Support Costs		$800,000	$2,400,000	
Total funding needed (including USG program costs)			***$112,932,165***	
Government of Rwanda malaria budget		$1,650,000	$4,950,000	
Belgian Technical Cooperation			$4,050,000	
GFATM approved funding		$15,272,334	$45,817,003	
Available funding from other sources			**$54,817,003**	
PMI funds available (estimated):				Assumes PMI funding is divided between countries based roughly on their populations
Year 1		$17,000,000		Assumes 3 PMI countries
Year 2		$20,000,000		Assumes 7 PMI countries
Year 3		$20,000,000		Assumes 15 PMI countries
Years 1 through 3			**$57,000,000**	
Total Available funding			**$111,817,003**	
Remaining Gap			**$1,115,162**	3-year shortfall to meet total need